

Section 6. Electricity

This section describes electrical energy sources; electricity consumed by end users (i.e., electricity sold to end users); estimates of the electrical system energy losses incurred in the generation, transmission, and distribution of electricity; and estimates of net interstate sales of electricity.

Electrical Energy Sources

Physical Units

Electricity is produced from a number of energy sources. In the Combined State Energy Data System (CSEDS), coal, natural gas, and petroleum are measured in physical units of thousand short tons, million cubic feet, and thousand barrels, respectively, as they are consumed by the electric utilities. Because comparable measures in physical units for nuclear power, hydroelectric, biomass fuels, geothermal, wind, photovoltaic, and solar thermal energy sources are not available, energy output in the form of electricity produced from these energy sources, in million kilowatthours, is used instead. The variable names for these data are as follows ("ZZ" in the variable name represents the two-letter State code that differs for each State):

- CLEUPZZ = coal consumed by electric utilities (described in Section 2 of this report), in thousand short tons;
- ELEXPZZ = electricity exported from the United States (assumed to be produced from hydroelectric power through 1989), in million kilowatthours;
- ELIMPZZ = electricity imported into the United States (assumed to be produced from hydroelectric power through 1989), in million kilowatthours;

- GEEOPZZ = electricity produced from geothermal energy at electric utilities (described in Section 5), in million kilowatthours;
- GEIMPZZ = electricity produced from geothermal energy and imported into the United States (described in Section 5), in million kilowatthours;
- HPEOPZZ = electricity produced from pumped storage hydroelectric power at electric utilities (described in Section 5), in million kilowatthours;
- HVEOPZZ = electricity produced from conventional hydroelectric power at electric utilities (described in Section 5), in million kilowatthours;
- HYEXPZZ = electricity produced from hydroelectric power and exported from the United States (described in Section 5), in million kilowatthours;
- HYIMPZZ = electricity produced from hydroelectric power and imported into the United States (described in Section 5), in million kilowatthours;
- NGEUPZZ = natural gas consumed by electric utilities (described in Section 3), in million cubic feet;
- NUEOPZZ = electricity produced from nuclear power at electric utilities, in million kilowatthours;
- PAEUPZZ = petroleum consumed by electric utilities (described in Section 4), in thousand barrels;
- SOEOPZZ = electricity produced from photovoltaic and solar thermal energy sources at electric utilities (described in Section 5), in million kilowatthours;
- WDEOPZZ = electricity produced from wood energy sources at electric utilities (described in Section 5), in million kilowatthours;
- WSEOPZZ = electricity produced from waste energy sources at electric utilities (described in Section 5), in million kilowatthours; and
- WYEOPZZ = electricity produced from wind energy at electric utilities (described in Section 5), in million kilowatthours.

The U.S. totals for these series are calculated as the sum of the State data, with the exception of coal, which is the sum of the U.S. totals for each rank of coal as described in Section 2.

British Thermal Units (Btu)

In order to total all the energy that is used to produce electricity, the energy sources are converted to the common unit of Btu. The methods for calculating the Btu content of coal, natural gas, petroleum, and renewable energy sources consumed by utilities are explained in their respective sections of this documentation. The factor for converting electricity produced from nuclear energy (NUEOKUS) is developed from data collected from nuclear steam-electric power plants. These U.S. average factors, which vary from year to year, can be found in Appendix C, Table C1.

NUEOKUS = factor for converting nuclear electricity from kilowatthours to Btu.

The formulas for applying the nuclear factor are:

NUEOBZZ = NUEOPZZ * NUEOKUS

NUEOBUS = Σ NUEOBZZ

A total of all energy input at electric utilities, including imports and exports of electricity across U.S. borders, is calculated by the following formulas for each State and for the United States:

TEEUBZZ = PAEUBZZ + NGEUBZZ + CLEUBZZ + HYENBZZ +
NUEOBZZ + GEENBZZ + WWEOBZZ + WNEOBZZ
+ EXNIBZZ

TEEUBUS = Σ TEEUBZZ

Data Sources

NUEOKUS — Factor for converting electricity produced from nuclear power from physical units to Btu.

- 1960 through 1991: Calculated annually by EIA by dividing the total heat content consumed in reactors at nuclear plants by the total (net)

electricity generated by nuclear plants. The heat content and electricity generation are reported on FERC Form 1, "Annual Report of Major Electric Utilities, Licensees, and Others;" Form EIA-412, "Annual Report of Public Electric Utilities," and predecessor forms. The factors for 1982 through 1991 are published in the following:

- 1982: EIA, *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215.
- 1983 through 1991: EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 13.
- 1992 forward: Unpublished factors calculated annually by EIA by dividing the total heat content of the steam leaving nuclear generating units to generate electricity by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation data are reported in the Nuclear Regulatory Commission, *Licensed Operating Reactors—Status Summary Report*.

NUEOPZZ — Electricity produced from nuclear power at electric utilities by State.

- 1960 through 1977: Federal Power Commission, News Release, "Power Production, Fuel Consumption, and Installed Capacity Data," table titled "Net Generation of Electric Utilities by State and Source."
- 1978 through 1980: EIA, *Energy Data Reports*, "Power Production, Fuel Consumption and Installed Capacity Data;" 1978: table titled "Net Generation of Electric Utilities by State and Source;" 1979 and 1980: Table 36.
- 1981 through 1985: EIA, Form EIA-759, "Monthly Power Plant Report," and predecessor forms. Published data rounded to gigawatthours in EIA, *Electric Power Annual 1985*, Table 6.
- 1986 forward: EIA, Form EIA-759, "Monthly Power Plant Report," and predecessor forms. Published data rounded to gigawatthours in *Electric Power Annual*. Data are from the report of the following year., i.e., 1986 final data are published in the *Electric Power Annual, 1987*.

The specific tables are:

- 1986: Table 19.
- 1987: Table 10.
- 1988 and 1989: Table 14.
- 1990 through 1993: Table 13.
- 1994 forward: Volume I, Table 10.

Electricity Imports and Exports

Imports and exports of electricity across U.S. borders prior to 1989 are assumed to be based on hydroelectric power. Beginning with 1989, traded electricity is identified in CSEDS as derived from hydroelectric power, geothermal energy, or nonrenewable energy sources. Electricity imports and exports based on renewable energy sources are summed in million kilowatthours and billion Btu and identified with "ER" as the source code in the variable name:

$$\begin{aligned} EREXPZZ &= HYEXPZZ \\ EREXPUS &= \Sigma EREXPZZ \\ ERIMPZZ &= HYIMPZZ + GEIMPZZ \\ ERIMPUS &= \Sigma ERIMPZZ \end{aligned}$$

$$\begin{aligned} EREXBZZ &= HYEXBZZ \\ EREXBUS &= \Sigma EREXBZZ \\ ERIMBZZ &= HYIMBZZ + GEIMBZZ \\ ERIMBUS &= \Sigma ERIMBZZ \end{aligned}$$

Imports and exports of electricity produced from nonrenewable energy sources ("EX"), in million kilowatthours, are calculated by subtracting renewable-based imports and exports from total electricity imports and exports :

$$\begin{aligned} EXIMPZZ &= ELIMPZZ - ERIMPZZ \\ EXIMPUS &= \Sigma EXIMPZZ \\ EXEXPZZ &= ELEXPZZ - EREXPZZ \\ EXEXPUS &= \Sigma EXEXPZZ \end{aligned}$$

Nonrenewable-based electricity imports and exports are converted from million kilowatthours to billion Btu by using the average conversion factor for fossil fuels burned at steam-electric power plants (FFEOKUS):

$$\begin{aligned} EXIMBZZ &= EXIMPZZ * FFEOKUS \\ EXIMBUS &= \Sigma EXIMBZZ \\ EXEXBZZ &= EXEXPZZ * FFEOKUS \\ EXEXBUS &= \Sigma EXEXBZZ \end{aligned}$$

Net imports of electricity produced from nonrenewable energy sources is calculated by subtracting exports from imports:

$$\begin{aligned} EXNIPZZ &= EXIMPZZ - EXEXPZZ \\ EXNIPUS &= \Sigma EXNIPZZ \\ EXNIBZZ &= EXIMBZZ - EXEXBZZ \\ EXNIBUS &= \Sigma EXNIBZZ \end{aligned}$$

Net imports of renewable-based electricity are included in the "Total" column of SEDR tables titled "Energy Consumption Estimates by Source" and "Estimates of Energy Input at Electric Utilities" but are not shown separately in the tables' columns. Table A8 provides the data by State and year.

Total imports and exports of electricity are calculated in billion Btu by summing the renewable and nonrenewable components:

$$\begin{aligned} ELIMBZZ &= HYIMBZZ + GEIMBZZ + EXIMBZZ \\ ELIMBUS &= \Sigma ELIMBZZ \\ ELEXBZZ &= HYEXBZZ + EXEXBZZ \\ ELEXBUS &= \Sigma ELEXBZZ \end{aligned}$$

Data Sources

ELEXPZZ — Electricity exported from the United States (assumed to be produced by hydroelectric power through 1989) by State.

- 1960 through 1981: Economic Regulatory Administration, *Staff Reports*, "Report on Electric Energy Exchanges with Canada and Mexico." Source data are arranged by the Regional Reliability Council Areas and then by the electric utility. State data were tabulated by aggregating the data of all electric utilities within each State.
- 1982 and 1983: EIA State estimates are based on data from Economic Regulatory Administration Form ERA-781R, "Annual Report of Electrical Export/Import Data." State estimates are consistent with national and regional totals published in the ERA, *Electricity Exchanges Across International Borders*.
- 1984 through 1987: EIA State estimates are based on data from Economic Regulatory Administration Form ERA-781R, "Annual Report of Electrical Export/Import Data," the Federal Energy Regulatory Commission Form 1, and the Bonneville Power Administration

Table A8. Net Imports of Electricity Produced from Nonrenewable Energy Sources, 1989–1997
(Trillion Btu)

State	1989	1990	1991	1992	1993	1994	1995	1996	1997
Alabama	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alaska	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.007
Arizona	0.000	-0.022	1.110	-0.022	-0.023	-0.026	3.464	-0.027	-0.624
Arkansas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
California	20.792	16.212	21.978	17.505	14.704	14.954	12.936	4.048	3.374
Colorado	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.184
Connecticut	0.494	0.386	0.423	2.313	2.551	4.114	5.643	3.301	5.186
Delaware	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dist. of Col.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Florida	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Georgia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hawaii	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Idaho	0.062	0.196	0.310	0.629	0.312	0.763	0.169	0.591	0.726
Illinois	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Indiana	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Iowa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kansas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kentucky	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Louisiana	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Maine	5.642	1.964	1.441	2.089	0.642	10.040	16.961	8.235	21.445
Maryland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Massachusetts	4.468	4.443	4.380	4.145	4.362	16.538	5.643	4.025	5.186
Michigan	0.029	-113.894	-5.486	-2.933	1.986	28.227	20.656	3.580	-4.417
Minnesota	4.363	-17.948	-3.137	-0.753	-5.186	24.527	14.737	22.694	58.071
Mississippi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Missouri	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Montana	0.039	0.073	0.039	0.072	0.048	0.467	0.128	0.097	0.025
Nebraska	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nevada	0.156	0.000	0.007	0.095	0.078	0.047	0.159	0.000	0.000
New Hampshire	0.401	0.386	2.060	2.313	2.551	4.415	5.643	3.301	5.186
New Jersey	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
New Mexico	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
New York	13.554	-17.148	-3.448	-1.126	8.156	45.442	28.023	9.920	8.423
North Carolina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
North Dakota	0.541	0.333	-2.206	1.274	0.217	2.362	0.979	2.329	-1.880
Ohio	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oklahoma	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oregon	4.623	4.668	8.347	14.957	7.807	16.106	6.080	9.618	3.301
Pennsylvania	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.564	0.149
Rhode Island	0.207	0.386	0.423	2.313	2.551	2.238	5.643	3.301	5.186
South Carolina	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
South Dakota	0.000	0.000	0.321	0.699	0.000	1.434	0.000	0.000	0.000
Tennessee	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Texas	0.014	-0.660	-4.663	-9.953	-8.258	-9.952	-9.542	-10.584	-11.314
Utah	(s)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.123
Vermont	4.971	1.347	3.469	-3.831	3.160	2.980	4.901	7.493	13.296
Virginia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Washington	6.706	5.646	-2.074	6.791	-5.441	-6.529	-26.088	-12.548	2.297
West Virginia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wisconsin	0.000	0.000	1.286	2.331	0.000	4.780	16.937	0.518	0.000
Wyoming	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
United States	67.063	-113.633	24.579	38.906	30.215	162.925	113.068	60.460	113.930

(s)=Number less than 0.0005.

Source: Combined State Energy Data System 1997.

Annual Report. State estimates are consistent with national and regional totals published in the ERA, *Electricity Transactions Across International Borders*.

- 1988 forward: EIA State estimates are based on data from DOE, Fossil Fuels, Fuels Programs, Office of Coal and Electricity, Form FE-781R, "Annual Report of International Electrical Export/Import Data," and predecessor forms, the Federal Energy Regulatory Commission Form 1, the Bonneville Power Administration data, and the Canada National Energy Board Annual Report.

ELIMPZZ — Electricity imported into the United States (assumed to be produced by hydroelectric power through 1989) by State.

- 1960 through 1981: Economic Regulatory Administration, *Staff Reports*, "Report on Electric Energy Exchanges with Canada and Mexico." Source data are arranged by the Regional Reliability Council Areas and then by the electric utility. State data were tabulated by aggregating the data of all electric utilities within each State.
- 1982 and 1983: EIA State estimates are based on data from Economic Regulatory Administration Form ERA-781R, "Annual Report of Electrical Export/Import Data." State estimates are consistent with national and regional totals published in the ERA, *Electricity Exchanges Across International Borders*.
- 1984 through 1987: EIA State estimates are based on data from Economic Regulatory Administration Form ERA-781R, "Annual Report of Electrical Export/Import Data," the Federal Energy Regulatory Commission Form 1, and the Bonneville Power Administration Annual Report. State estimates are consistent with national and regional totals published in the ERA, *Electricity Transactions Across International Borders*.
- 1988 forward: EIA State estimates are based on data from DOE, Fossil Fuels, Fuels Programs, Office of Coal and Electricity, Form FE-781R, "Annual Report of International Electrical Export/Import Data," and predecessor forms, the Federal Energy Regulatory Commission Form 1, the Bonneville Power Administration data, and the Canada National Energy Board Annual Report.

FFEOKUS — Fossil fuel steam-electric power plant conversion factor.

- 1960 through 1991: Estimated by EIA as the weighted annual average heat rate for fossil-fueled steam-electric plants in the United States as published in the EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 9.

- 1992 forward: Unpublished factors calculated on the basis of data from Form EIA-767.

Electricity Consumed by the End User

Physical Units

The amount of electricity sold to end users is considered to be the amount of electricity consumed by the end-use sectors. Five electricity sales data series, in physical units of million kilowatthours, and one data series that represents the proportional share of an end-use sector are used to estimate consumption of electricity by end-use sector:

ESRCPZZ	= electricity sold to the residential sector of each State;
ESCMPZZ	= a portion of the electricity sold to the commercial sector of each State;
ESICPZZ	= electricity sold to the industrial sector of each State;
ESOTPZZ	= electricity sold to "Other" users (i.e., public street and highway lighting, other public authorities, railroads and railways, and interdepartmental sales) in each State; and
ESTRPZZ	= electricity consumed by transit systems, in each State.

U.S. totals for the five State-level series are calculated as the sum of the State data.

The sales of electricity to the residential and industrial sectors are used directly as consumption of electricity by these sectors.

Electricity consumed by transit systems in each State is assumed to be the total electricity used for transportation:

ESACPZZ	= ESTRPZZ
ESACPUS	= Σ ESACPZZ

The commercial sector consumption of electricity, represented by ESCCPZZ, is estimated as the sum of sales to the commercial sector and

the portion of sales to the "Other" sector that is not used for transportation:

$$\begin{aligned} \text{ESCCPZZ} &= \text{ESCMPZZ} + \text{ESOTPZZ} - \text{ESACPZZ} \\ \text{ESCCPUS} &= \Sigma \text{ESCCPZZ} \end{aligned}$$

Total electricity consumed by the major end-use sectors is represented by ESTCPZZ and is calculated by adding the four major sector estimates:

$$\begin{aligned} \text{ESTCPZZ} &= \text{ESRCPZZ} + \text{ESCCPZZ} + \text{ESICPZZ} + \text{ESACPZZ} \\ \text{ESTCPUS} &= \Sigma \text{ESTCPZZ} \end{aligned}$$

British Thermal Units (Btu)

Electricity consumption estimates are converted into Btu by applying a constant factor of 3.412 thousand Btu per kilowatthour as illustrated in the formulas:

$$\begin{aligned} \text{ESRCBZZ} &= \text{ESRCPZZ} * 3.412 \\ \text{ESTCBZZ} &= \text{ESTCPZZ} * 3.412 \end{aligned}$$

And U.S. totals in Btu are calculated by summing the States' Btu values.

Additional Calculations

Additional calculations are performed in CSEDS to provide data for the EIA *Monthly Energy Review* and *Annual Energy Review*. The share of electricity sold to the "Other" category of consumers that is used for transportation is calculated:

$$\text{ESTRSUS} = \text{ESACPUS} / \text{ESOTPUS}$$

Data Sources

ESCMPZZ — A portion of the electricity sold to the commercial sector by State.

Note: Data for Maryland and the District of Columbia were combined for 1960 through 1983. The method for disaggregating the data is explained in Note 3 on page 427.

- 1960 through 1975: Federal Power Commission, *Electric Power Statistics*, "Sales of Electric Energy to Ultimate Consumers."
- 1976 through 1980: EIA, *Electric Power Annual* (November 1982), Table 125.
- 1981 through 1983: EIA, Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Published data rounded to gigawatthours in EIA, *Electric Power Annual 1983*, Table 51.
- 1984 through 1986: EIA, Form EIA-861, "Annual Electric Utility Report." Unpublished data.
- 1987: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours in EIA, *Electric Power Annual 1988*, Table 19.
- 1988 forward: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours.
 - 1988 through 1990: EIA, *Electric Power Annual*, Table 27.
 - 1991 forward: EIA, *Electric Sales and Revenue*, Table 15.

ESICPZZ — Electricity consumed by the industrial sector by State.

Note: Data for Maryland and the District of Columbia were combined for 1960 through 1983. The method for disaggregating the data is explained in Appendix A, Note 3, on page 427.

- 1960 through 1975: Federal Power Commission, *Electric Power Statistics*, "Sales of Electric Energy to Ultimate Consumers."
- 1976 through 1980: EIA, *Electric Power Annual* (November 1982), Table 126.
- 1981 through 1983: EIA, Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Published data rounded to gigawatthours in EIA, *Electric Power Annual 1983*, Table 51.
- 1984 through 1986: EIA, Form EIA-861, "Annual Electric Utility Report." Unpublished data.
- 1987: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours in EIA, *Electric Power Annual 1988*, Table 19.
- 1988 forward: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours in EIA, *Electric Power Annual (Volume I for 1994)*. The specific tables are:
 - 1988 through 1990: EIA, *Electric Power Annual*, Table 27.
 - 1991 forward: EIA, *Electric Sales and Revenue*, Table 16.

ESOTPZZ — Electricity sold to the "Other" sector (i.e., public street and highway lighting, sales to other public authorities, railroads and railways, and interdepartmental sales) by State.

Note: Data for Maryland and the District of Columbia were combined for 1960 through 1983. The method for disaggregating the data is explained in Appendix A, Note 3, on page 427.

- 1960 through 1975: Federal Power Commission, *Electric Power Statistics*, "Sales of Electric Energy to Ultimate Consumers."
- 1976 through 1980: EIA, *Electric Power Annual* (November 1982), Table 127.
- 1981 through 1983: EIA, Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Published data rounded to gigawatthours in EIA, *Electric Power Annual 1983*, Table 51.
- 1984 through 1986: EIA, Form EIA-861, "Annual Electric Utility Report." Unpublished data.
- 1987: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours in EIA, *Electric Power Annual 1988*, Table 19.
- 1988 forward: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours.
 - 1988 through 1990: EIA, *Electric Power Annual*, Table 27.
 - 1991 forward: EIA, *Electric Sales and Revenue*, Table 6.

ESRCPZZ — Electricity consumed by the residential sector by State.

Note: Data for Maryland and the District of Columbia were combined for 1960 through 1983. The method for disaggregating the data is explained in Appendix A, Note 3, on page 427.

- 1960 through 1975: Federal Power Commission, *Electric Power Statistics*, "Sales of Electric Energy to Ultimate Consumers."
- 1976 through 1980: EIA, *Electric Power Annual* (November 1982), Table 124.
- 1981 through 1983: EIA, Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Published data rounded to gigawatthours in EIA, *Electric Power Annual 1983*, Table 51.
- 1984 through 1986: EIA, Form EIA-861, "Annual Electric Utility Report." Unpublished data.
- 1987: EIA, Form EIA-861, "Annual Electric Utility Report." Published data rounded to gigawatthours in EIA, *Electric Power Annual 1988*, Table 19.

- 1988 forward: EIA, Form EIA-861, “Annual Electric Utility Report.” Published data rounded to gigawatthours.
 - 1988 through 1990: *Electric Power Annual*, Table 27.
 - 1991 forward: EIA, *Electric Sales and Revenue*, Table 14.

ESTRPZZ — Electricity consumed by transit systems by State.

Note: The transit system data include electricity used to operate commuter rail, rapid rail, streetcars or light rail, cable cars, trolley-buses, motorbuses, automated guideways, inclined plane railways, and aerial tramways. These data do not include electricity used by Amtrak.

- 1960 through 1978: EIA estimates are based on data from:
 - The American Public Transit Association (formerly the American Transit Association) annual operating reports.
 - Pushkarev, Boris S. and others, *Urban Rail in America*. (Bloomington, IN: Indiana University Press, 1982.)
 - U.S. Department of Transportation, *A Directory of Regularly Scheduled, Fixed Route, Local Public Transportation Service in Urbanized Areas Over 50,000 Population*, 1980 and 1981.
- 1979 through 1989: U.S. Department of Transportation, Urban Mass Transportation Administration, *National Urban Mass Transportation Statistics, Section 15 Annual Report*, table titled “Energy Consumption: Details by Transit System.”
 - 1979 and 1980: Table 2.13.1.
 - 1981 and 1982: Table 3.13.1.
 - 1983 through 1989: Table 3.12.
- 1990 forward: U.S. Department of Transportation, Federal Transit Administration, *Data Tables for the Section 15 Report Year*.
 - 1990: Table 2.12.
 - 1991: Table 13.
 - 1992 forward: Table 15.
- Data for 1997 also available via internet at <http://www.ntdprogram.com/NTD/NTDData.nsf/Data+Tables?OpenView>

Notes: These data are available on a fiscal year basis (July 1 through June 30) for 1979 through 1982 and for calendar years 1983 forward. Some data for 1979 through 1983 were adjusted by EIA on the basis of an analysis of historical trends. Electricity consumption for the District of Columbia for 1976 forward is partially apportioned to Maryland and Virginia on the basis of electricity consumption data from the Washington Metropolitan Area Transit Authority.

Estimates of Electrical System Energy Losses

British Thermal Units (Btu)

Electrical system energy losses, identified by “LO,” include all losses incurred in the generation, transmission, and distribution of electricity, including plant use and unaccounted for quantities. Total losses for the United States, LOTCBUS, is assumed to be the difference between the total of all energy input at electric utilities (TEEUBUS) and the total electricity sold to end users (ESTCBUS). Total losses for the United States is calculated in billion Btu as follows:

$$\text{LOTCBUS} = \text{TEEUBUS} - \text{ESTCBUS}$$

Because Alaska and Hawaii have no exchanges of electricity with other States, their electrical system energy losses are estimated as the difference between the sum of all energy input at the State’s electric utilities and the electricity sold within the State:

$$\text{LOTCBAK} = \text{TEEUBAK} - \text{ESTCBAK}$$

$$\text{LOTCBHI} = \text{TEEUBHI} - \text{ESTCBHI}$$

Individual State electrical system energy losses for the remaining States are estimated by a different method. The difference between each of the contiguous 48 States’ (including the District of Columbia) TEEUB series and ESTCB is not only the losses but also any net interstate flow of electricity that may occur between States. In some cases these net interstate flows are substantial. Therefore, an effort is made to estimate separately each State’s losses and net interstate flow. The methodology is to calculate the contiguous-48-State subtotal of losses and subtotal of sales; to create annual losses-to-sales ratios for the aggregate of the 48 States; and to apply the annual losses-to-sales ratios from the total 48 States to the individual 48 States’ sales to estimate their losses.

The following steps are performed to complete the losses estimates. A subtotal of losses in the contiguous 48 States, LOTCB48, is created by subtracting the Alaska and Hawaii losses from the total United States’ losses:

$$\text{LOTCB48} = \text{LOTCBUS} - (\text{LOTCBAK} + \text{LOTCBHI})$$

A similar subtotal of electricity sales in the 48 States only, ESTCB48, is calculated:

$$\text{ESTCB48} = \text{ESTCBUS} - (\text{ESTCBAK} + \text{ESTCBHI})$$

The losses-to-sales ratio for the contiguous 48 States only, ELLSS48, is calculated:

$$\text{ELLSS48} = \text{LOTCB48} / \text{ESTCB48}$$

Over the 38-year period now covered in CSEDS, the ratio is fairly constant, with a slight downward trend. For 1960, the ratio is 2.5; for 1961 through 1983 the ratio is 2.4; for 1984 through 1988 the ratio is 2.3; for 1989 through 1991 it is 2.2; and for 1992 forward the losses-to-sales ratio is 2.1. The decline in the ratio in recent years is attributed partially to the fact that electricity produced by nonutility power producers is included in the electricity sales data, while the resources consumed to produce the nonutility electricity are not. When the electricity purchased by utilities from nonutilities is subtracted from the electricity sales, the ratio is 2.3 for 1989 through 1993, and 2.2 for 1994 forward.

The U.S. ratios are applied to each State's sales to the major end-use sectors and total sales (temporarily including Alaska, Hawaii, and the 48-State subtotal for processing convenience):

$$\begin{aligned}\text{LORCBZZ} &= \text{ESRCBZZ} * \text{ELLSS48} \\ \text{LOCCBZZ} &= \text{ESCCBZZ} * \text{ELLSS48} \\ \text{LOICBZZ} &= \text{ESICBZZ} * \text{ELLSS48} \\ \text{LOACBZZ} &= \text{ESACBZZ} * \text{ELLSS48} \\ \text{LOTCBZZ} &= \text{ESTCBZZ} * \text{ELLSS48}\end{aligned}$$

Alaska, Hawaii, and the contiguous 48-State subtotal are recalculated to their original estimates. The end-use losses for Alaska and Hawaii are created in proportion to each sector's share of the State's total electricity sales:

$$\begin{aligned}\text{LOTCBAK} &= \text{TEEUBAK} - \text{ESTCBAK} \\ \text{LOTCBHI} &= \text{TEEUBHI} - \text{ESTCBHI} \\ \text{LOTCB48} &= \text{LOTCBUS} - (\text{LOTCBAK} + \text{LOTCBHI})\end{aligned}$$

$$\text{LORCBAK(HI)} = (\text{ESRCBAK(HI)} / \text{ESTCBAK(HI)}) * \text{LOTCBAK(HI)}$$

$$\text{LOCCBAK(HI)} = (\text{ESCCBAK(HI)} / \text{ESTCBAK(HI)}) * \text{LOTCBAK(HI)}$$

$$\begin{aligned}\text{LOICBAK(HI)} &= (\text{ESICBAK(HI)} / \text{ESTCBAK(HI)}) * \text{LOTCBAK(HI)} \\ \text{LOACBAK(HI)} &= (\text{ESACBAK(HI)} / \text{ESTCBAK(HI)}) * \text{LOTCBAK(HI)}\end{aligned}$$

Losses for the United States, including Alaska and Hawaii, are the sums of all the States' losses.

Physical Units

Estimates of losses in physical units of million kilowatthours are made by dividing the Btu estimate by the constant 3.412 thousand Btu per kilowatthour as illustrated in the following formulas:

$$\begin{aligned}\text{LORCPZZ} &= \text{LORCBZZ} / 3.412 & \text{LORCPUS} &= \text{LORCBUS} / 3.412 \\ \text{LOTCPZZ} &= \text{LOTCBZZ} / 3.412 & \text{LOTCPUS} &= \text{LOTCBUS} / 3.412\end{aligned}$$

Net Interstate Flow of Electricity

British Thermal Units (Btu)

An estimate of the net interstate flow of electricity is calculated as the difference between the total electricity sales and attributed losses and the total energy input to the electric utilities within each State. The estimated net interstate flow of electricity (ELISB) for each State and the United States is calculated:

$$\begin{aligned}\text{ELISBZZ} &= (\text{ESTCBZZ} + \text{LOTCBZZ}) - \text{TEEUBZZ} \\ \text{ELISBUS} &= \Sigma \text{ELISBZZ}\end{aligned}$$

Physical Units

Estimates of net interstate flow of electricity in physical units of million kilowatthours are calculated by dividing the Btu value by the constant 3.412 thousand Btu per kilowatthour:

ELISPZZ = ELISBZZ / 3.412
 ELISPUS = ΣELISPZZ

Positive net interstate flow for a State means that the amount consumed within the State (including attributed losses) is greater than the amount of energy input at electric utilities in the State. That is, the State is using more electricity than it generates and, therefore, is a net buyer from other States.

A negative number indicates that the State's input into its electric utilities is greater than the requirements for electricity within its own borders, and, therefore, it is a net seller of electricity to other States.

Additional Notes on Electricity

- The source for the electricity sales data for 1960 through 1983 is the Energy Information Administration (EIA) Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Electricity sales data for 1984 forward are from Form EIA-861, "Annual Electric Utility Report." At the national level, data from both forms correspond closely (within 3 percent) for all end-use sectors. However, differences in the number of survey respondents and the reporting of commercial and industrial sales caused inconsistencies between 1983 and 1984 data in those end-use sectors for some States. See the EIA's, *Electric Power Annual, 1991*, DOE/EIA-0348(91), p. 130, and *An Assessment of the Quality of Selected EIA Data Series, Electric Power Data*, DOE/EIA-0292(87), pp. 17–28, for detailed discussions of the reporting differences.

- The source document for CSEDS electricity sales, the EIA *Electric Sales and Revenue*, includes a category called "Other" sales. Sales to the "Other" category include: (1) public street and highway lighting; (2) sales to other public authorities; (3) railroads and railways; and (4) interdepartmental sales. These sales are allocated to the transportation and commercial sectors in CSEDS as described on page 423.

ESTRSUS, the share of "Other" allocated to the transportation sector in CSEDS is calculated for use by other EIA reports. The shares are shown in Table A9.

- The source for the electricity sales data for 1960 through 1983 is the EIA Form EIA-826, "Electric Utility Company Monthly Statement," and predecessor forms. Electricity sales data for the District of Columbia and Maryland are combined on those forms. Estimates of separate sales for the District of Columbia and Maryland were created by using electricity sales data by end-use sector by communities from the FERC Form 1, "Annual Report of Major Electric Utilities, Licensees, and Others," filed by the Potomac Electric Power Company (PEPCO). PEPCO sales to the District of Columbia were assumed to be total electricity sales in the District of Columbia. Electricity sales to the District of Columbia reported by PEPCO on the FERC Form 1 were subtracted from the EIA-826 District of Columbia and Maryland aggregate figures to obtain estimates of Maryland electricity sales by sector. Beginning with 1981 data, electric utilities were no longer required to report sales to specific communities. Therefore, sales data for the District of Columbia for 1981 through 1983 were obtained directly from PEPCO's accounting department.

Table A9. Railroads and Railways Share of Other Electricity Sales

Year	ESTRSUS	Year	ESTRSUS	Year	ESTRSUS
1960	0.09730	1973	0.05203	1986	0.04980
1961	0.09321	1974	0.04909	1987	0.05173
1962	0.09368	1975	0.04360	1988	0.05211
1963	0.08659	1976	0.04234	1989	0.05314
1964	0.09088	1977	0.04331	1990	0.05165
1965	0.08705	1978	0.04014	1991	0.05044
1966	0.07687	1979	0.04058	1992	0.05036
1967	0.07395	1980	0.04400	1993	0.05025
1968	0.07116	1981	0.03759	1994	0.05105
1969	0.06660	1982	0.03768	1995	0.05214
1970	0.06428	1983	0.04631	1996	0.05047
1971	0.05995	1984	0.04914	1997	0.04769
1972	0.05398	1985	0.04751		

Alternative Method for Calculating Interstate Flow of Electricity and Electrical System Energy Losses

EIA is examining a method to disaggregate the estimates of net interstate sales of electricity and electrical system energy losses as shown in Tables A10 through A21.

The fuel consumed at electric utilities and the net generation of other energy sources by electric utilities collected by EIA on Form EIA-759, "Monthly Power Plant Report," represent the total energy input at electric utilities, TIEUB, shown in column 1 of Tables A10 through A21. This series is equal to the CSEDS series TEEUB, except TEEUB also contains net imports of electricity. The formulas for TIEUB for each State and the United States are:

$$\begin{aligned} \text{TIEUBZZ} &= \text{PAEUBZZ} + \text{NGEUBZZ} + \text{CLEUBZZ} + \text{HYEOBZZ} + \\ &\quad \text{NUEOBZZ} + \text{GEEOBZZ} + \text{WWEOBZZ} + \text{WNEOBZZ} \\ \text{TIEUBUS} &= \Sigma \text{TIEUBZZ} \end{aligned}$$

Another series collected on Form EIA-759 is the net generation of electricity by electric utilities (total generation minus plant use). This data series, in thousand kilowatthours, given the variable name ELEOP, represents the energy output of electric utilities. ELEOPZZ is converted to Btu by using the standard conversion factor of 3.412 thousand Btu per kilowatthour:

$$\begin{aligned} \text{ELEOBZZ} &= \text{ELEOPZZ} * 3.412 \\ \text{ELEOBUS} &= \Sigma \text{ELEOBZZ} \end{aligned}$$

Subtracting energy output by electric utilities, ELEOBZZ (shown in column 3 of Tables A10 through A21), from energy input at electric utilities, TIEUBZZ (shown in column 1 of those tables), gives an indication of energy losses that occur at electric utility plants, ELPLBZZ (shown in column 2). These losses are primarily energy lost in the conversion of the energy sources to electricity. Plant use of electricity is also included in this number.

$$\begin{aligned} \text{ELPLBZZ} &= \text{TIEUBZZ} - \text{ELEOBZZ} \\ \text{ELPLBUS} &= \Sigma \text{ELPLBZZ} \end{aligned}$$

Data for electricity imported or exported across U.S. borders, described earlier in "Electrical Energy Sources," are reported in thousand kilowatthours. These data are converted to Btu by using the standard conversion factor and are shown in column 4 of Tables A10 through A21. The electricity trade data are added to the net generation of each State involved in international exchanges of electricity to derive electricity transmitted for sale within the United States (shown in column 5 of the following tables).

$$\begin{aligned} \text{ETIMBZZ} &= \text{ELIMPZZ} * 3.412 \\ \text{ETEXPZZ} &= \text{ELEXPZZ} * 3.412 \\ \text{ETNIBZZ} &= \text{ETIMBZZ} - \text{ETEXPZZ} \\ \text{ETNIBUS} &= \Sigma \text{ETNIBZZ} \\ \\ \text{ETENBZZ} &= \text{ELEOBZZ} + \text{ETNIBZZ} \\ \text{ETENBUS} &= \Sigma \text{ETENBZZ} \end{aligned}$$

Total electrical energy lost in the transmission and distribution of electricity is reported by each electric utility. However, some electric utilities distribute electricity to more than one State. The EIA Electric Power Division has estimated these losses by State. The losses in million kilowatthours are converted to billion Btu by using the standard conversion factor and are shown in column 6 in the following tables.

$$\begin{aligned} \text{ELLOBZZ} &= \text{ELLOPZZ} * 3.412 \\ \text{ELLOBUS} &= \Sigma \text{ELLOBZZ} \end{aligned}$$

Subtracting the State estimates for transmission and distribution losses (column 6) from the electricity transmitted (column 5) yields the electricity available for sale within each State, ELFSBZZ, shown in column 7.

$$\begin{aligned} \text{ELFSBZZ} &= \text{ETENBZZ} - \text{ELLOBZZ} \\ \text{ELFSBUS} &= \Sigma \text{ELFSBZZ} \end{aligned}$$

Column 7, electricity available for sale, can be compared to column 8, the actual reported sales to consumers within each State. The sales data are collected on Form EIA-861, "Annual Electric Utility Report," and are currently used in CSEDS as variable ESTCBZZ. If column 7, the electricity available for sale, is larger than column 8, the electricity sold, the State would be a supplier of electricity to neighboring States. If the electricity available within the State is less than the amount needed to meet sales

demand, the State would be a purchaser of electricity from other States. Column 9 of Tables A10 through A21 shows the difference between columns 8 and 7 for each State as calculated:

$$\begin{aligned} \text{ESISBZZ} &= \text{ESTCBZZ} - \text{ELFSBZZ} \\ \text{ESISBUS} &= \Sigma \text{ESISBZZ} \end{aligned}$$

Negative values in column 9 show the amount of electricity that flowed out of the State. Positive numbers show the amount of electricity that flowed into the State to meet the State's own requirements. For comparison, data in column 10 are the "Net Interstate Flow of Electricity and Associated Losses" (ELISBZZ) series now calculated by CSEDS (as described earlier in "Net Interstate Flow of Electricity") and shown in the State tables of this report. Values in Column 9 are estimates of the net

interstate flow of electricity alone and would be a subset of the data in column 10, which include electrical system energy losses associated with that flow.

There are some unresolved problems with the separate estimate of electricity flow as shown in Column 9: Alaska and Hawaii appear to have small purchases of electricity from other States, and the total United States appears to have excess electricity. The current methodology used in CSEDS avoids these discrepancies as shown in column 10. The U.S. value in column 9 may reflect, at least in part, the electricity that is generated by companies other than electric utilities that would be included in the electricity sales to end users (column 8) but not in the electricity available for sale (column 7). The U.S. value for electricity production by nonutilities is shown in the footnotes on Tables A10 through A21.

Comments on these methodologies would be appreciated.

Table A10. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1997
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	1,159,115	771,226	387,889	0	387,889	19,109	368,780	254,378	-114,402	-376,455
Alaska	56,580	39,152	17,429	6	17,434	1,238	16,196	16,516	319	0
Arizona	819,264	552,921	266,342	-207	266,136	15,214	250,922	185,803	-65,118	-246,967
Arkansas	453,238	307,239	145,998	0	145,998	8,354	137,645	125,758	-11,887	-66,311
California	1,233,922	851,153	382,769	4,446	387,215	78,852	308,363	777,514	469,151	1,144,690
Colorado	363,610	246,321	117,289	147	117,436	9,221	108,215	129,892	21,677	35,593
Connecticut	140,207	95,074	45,133	4,140	49,273	7,118	42,155	97,010	54,855	145,760
Delaware	69,652	47,206	22,446	0	22,446	1,966	20,481	34,538	14,057	36,612
Dist. of Col.	1,203	962	241	0	241	1,767	-1,526	34,484	36,010	104,897
Florida	1,485,601	980,681	504,920	0	504,920	37,633	467,288	597,240	129,952	351,963
Georgia	1,098,989	751,714	347,275	0	347,275	17,131	330,144	348,877	18,733	-25,579
Hawaii	66,993	45,795	21,198	0	21,198	1,929	19,268	31,947	12,678	0
Idaho	139,321	93,218	46,102	579	46,682	5,914	40,768	72,455	31,687	81,854
Illinois	1,397,606	950,162	447,444	0	447,444	31,789	415,655	431,443	15,788	-70,160
Indiana	1,165,379	788,468	376,911	0	376,911	20,552	356,359	304,168	-52,190	-229,526
Iowa	373,086	256,858	116,228	0	116,228	8,043	108,184	123,337	15,153	6,392
Kansas	423,722	294,599	129,123	0	129,123	9,651	119,472	110,105	-9,366	-84,954
Kentucky	924,511	612,115	312,396	0	312,396	13,887	298,509	262,163	-36,346	-117,899
Louisiana	661,620	453,079	208,541	0	208,541	13,760	194,782	258,922	64,140	135,020
Maine	34,167	23,171	10,996	17,247	28,243	2,664	25,579	40,804	15,225	39,257
Maryland	455,898	303,883	152,015	0	152,015	11,256	140,758	191,974	51,216	134,762
Massachusetts	332,844	217,182	115,662	4,140	119,802	9,898	109,905	162,614	52,709	154,968
Michigan	932,911	627,317	305,594	4,726	310,321	22,114	288,207	332,297	44,090	75,204
Minnesota	452,379	314,867	137,512	47,254	184,766	13,808	170,958	189,961	19,002	-10,717
Mississippi	342,801	236,252	106,549	0	106,549	10,479	96,070	136,783	40,713	78,047
Missouri	753,135	510,634	242,502	0	242,502	18,823	223,679	224,075	396	-63,711
Montana	294,796	199,917	94,878	37	94,915	5,535	89,380	40,662	-48,717	-169,798
Nebraska	304,358	207,498	96,860	0	96,860	6,846	90,014	77,051	-12,963	-67,291
Nevada	242,358	164,326	78,032	0	78,032	4,378	73,654	82,636	8,982	11,892
New Hampshire	153,286	104,617	48,670	4,140	52,810	4,599	48,211	30,985	-17,226	-70,464
New Jersey	255,900	174,826	81,074	0	81,074	19,270	61,804	224,902	163,099	436,070
New Mexico	323,468	219,170	104,299	0	104,299	5,255	99,044	59,805	-39,239	-139,462
New York	1,140,477	771,644	368,832	13,513	382,345	37,971	344,374	450,166	105,793	203,743
North Carolina	1,067,877	701,527	366,350	0	366,350	22,212	344,138	372,079	27,941	76,920
North Dakota	333,626	232,222	101,404	-275	101,129	3,715	97,413	28,260	-69,154	-245,846
Ohio	1,432,906	950,965	481,941	0	481,941	34,955	446,986	540,830	93,843	231,097
Oklahoma	509,634	344,561	165,073	0	165,073	11,675	153,398	151,673	-1,725	-42,972
Oregon	502,550	335,129	167,421	2,636	170,057	12,971	157,086	162,421	5,335	-10,786
Pennsylvania	1,811,046	1,206,554	604,492	119	604,611	31,055	573,556	436,310	-137,245	-468,983
Rhode Island	28,049	15,893	12,156	4,140	16,296	987	15,309	22,837	7,529	29,705
South Carolina	814,725	547,311	267,414	0	267,414	12,959	254,455	233,840	-20,615	-95,257
South Dakota	129,654	87,177	42,478	0	42,478	2,388	40,090	26,520	-13,570	-48,059
Tennessee	942,702	624,385	318,317	0	318,317	16,491	301,825	296,561	-5,264	-30,255
Texas	2,931,245	1,985,471	945,773	-3,744	942,029	64,071	877,959	978,232	100,274	89,856
Utah	344,727	228,824	115,903	98	116,002	6,595	109,406	69,521	-39,885	-131,124
Vermont	56,337	38,173	18,164	11,361	29,524	2,843	26,681	18,125	-8,556	-34,902
Virginia	600,761	399,501	201,260	0	201,260	19,583	181,677	298,278	116,601	316,969
Washington	1,218,362	817,613	400,750	-4,411	396,339	25,781	370,558	301,302	-69,257	-278,000
West Virginia	860,927	559,700	301,227	0	301,227	7,441	293,785	89,556	-204,230	-585,386
Wisconsin	528,330	362,643	165,687	0	165,687	12,800	152,888	205,041	52,153	102,531
Wyoming	436,648	297,558	139,090	0	139,090	3,787	135,303	40,215	-95,089	-312,918
United States	32,602,503	21,948,454	10,654,049	110,092	10,764,141	768,334	9,995,807	10,712,864	717,058	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1997 was 762,469 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A11. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1996
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	1,174,467	781,769	392,698	0	392,698	19,893	372,805	249,432	-123,373	-405,914
Alaska	54,946	37,946	16,999	4	17,004	1,242	15,761	16,308	546	0
Arizona	754,447	512,615	241,832	-9	241,823	13,264	228,559	177,712	-50,847	-206,851
Arkansas	458,491	309,463	149,028	0	149,028	7,665	141,363	123,298	-18,065	-78,584
California	1,257,197	865,820	391,377	4,191	395,568	76,848	318,720	744,200	425,479	1,016,242
Colorado	354,210	238,298	115,911	0	115,911	8,141	107,770	126,493	18,723	35,542
Connecticut	167,746	113,926	53,820	4,140	57,960	7,154	50,806	96,959	46,153	118,463
Delaware	82,980	55,268	27,712	0	27,712	1,939	25,772	32,894	7,122	18,374
Dist. of Col.	1,802	1,428	375	0	375	1,872	-1,497	34,586	36,084	104,765
Florida	1,454,190	958,972	495,218	0	495,218	35,736	459,482	586,291	126,808	352,295
Georgia	1,053,154	716,290	336,864	0	336,864	18,738	318,127	345,660	27,533	11,897
Hawaii	68,154	46,249	21,906	0	21,906	1,966	19,940	32,001	12,061	0
Idaho	126,406	84,674	41,732	741	42,473	6,774	35,699	72,059	36,360	93,378
Illinois	1,533,637	1,041,913	491,724	0	491,724	36,023	455,701	428,510	-27,191	-213,307
Indiana	1,107,760	747,600	360,161	0	360,161	18,905	341,256	303,331	-37,924	-173,132
Iowa	364,888	250,972	113,916	0	113,916	10,826	103,090	119,418	16,328	3,064
Kansas	444,474	308,422	136,052	0	136,052	9,285	126,767	106,764	-20,004	-115,513
Kentucky	895,115	593,364	301,751	0	301,751	14,771	286,980	262,788	-24,192	-85,410
Louisiana	637,002	436,912	200,090	0	200,090	15,643	184,448	256,818	72,371	154,309
Maine	82,897	56,283	26,614	13,314	39,928	2,518	37,409	40,011	2,601	56
Maryland	452,033	300,606	151,426	0	151,426	10,833	140,593	194,476	53,883	147,187
Massachusetts	278,313	183,599	94,713	5,047	99,760	9,400	90,361	161,366	71,005	203,603
Michigan	987,891	663,222	324,670	6,488	331,158	22,329	308,828	328,581	19,752	4,883
Minnesota	465,232	322,639	142,593	34,095	176,688	15,351	161,337	187,461	26,124	9,100
Mississippi	318,166	219,770	98,396	0	98,396	8,042	90,355	135,192	44,837	98,388
Missouri	713,553	482,126	231,427	0	231,427	19,029	212,397	221,245	8,848	-31,850
Montana	276,034	187,189	88,846	154	89,000	5,793	83,206	47,152	-36,054	-131,215
Nebraska	293,272	200,047	93,225	0	93,225	6,822	86,403	73,349	-13,053	-67,267
Nevada	236,775	163,887	72,887	0	72,887	4,392	68,496	77,023	8,527	548
New Hampshire	164,779	112,171	52,608	4,140	56,748	2,440	54,308	31,143	-23,165	-81,362
New Jersey	211,578	144,052	67,526	0	67,526	17,458	50,068	228,227	178,159	491,637
New Mexico	310,174	209,983	100,191	0	100,191	4,995	95,196	58,596	-36,600	-129,629
New York	1,104,744	748,667	356,077	21,661	377,738	38,323	339,415	448,771	109,356	212,401
North Carolina	1,033,804	683,097	350,708	0	350,708	22,155	328,553	369,507	40,955	104,725
North Dakota	345,368	240,381	104,986	3,482	108,468	4,630	103,838	28,368	-75,470	-268,507
Ohio	1,449,288	961,712	487,576	0	487,576	35,426	452,150	541,100	88,950	217,955
Oklahoma	496,128	333,906	162,222	0	162,222	11,483	150,739	147,710	-3,029	-41,003
Oregon	492,575	329,195	163,380	12,061	175,441	14,870	160,571	160,995	424	-33,049
Pennsylvania	1,804,768	1,207,593	597,175	707	597,882	32,224	565,658	435,450	-130,208	-465,198
Rhode Island	26,208	14,944	11,263	4,140	15,403	1,087	14,317	22,534	8,217	30,683
South Carolina	790,853	530,430	260,423	0	260,423	12,380	248,043	228,898	-19,145	-85,569
South Dakota	109,626	75,280	34,346	0	34,346	2,726	31,620	26,396	-5,225	-28,295
Tennessee	903,081	600,617	302,464	0	302,464	17,366	285,098	299,093	13,995	18,486
Texas	2,860,524	1,931,496	929,028	-3,494	925,534	65,395	860,139	950,070	89,931	77,425
Utah	331,859	221,895	109,964	0	109,964	6,434	103,530	67,756	-35,775	-123,089
Vermont	52,894	35,820	17,074	11,757	28,831	2,860	25,971	17,877	-8,094	-33,422
Virginia	579,512	386,622	192,890	0	192,890	20,772	172,118	298,876	126,758	341,389
Washington	1,171,148	786,935	384,213	4,759	388,972	34,486	354,486	298,254	-56,232	-266,581
West Virginia	818,784	532,251	286,533	0	286,533	8,013	278,520	89,145	-189,376	-544,111
Wisconsin	554,879	378,644	176,235	649	176,884	13,567	163,317	200,433	37,116	60,732
Wyoming	439,354	299,968	139,386	0	139,386	3,847	135,539	39,153	-96,386	-318,716
United States	32,147,160	21,646,927	10,500,233	128,029	10,628,262	784,133	9,844,128	10,569,728	725,599	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1996 was 766,492 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A12. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1995
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	1,009,931	670,132	339,799	0	339,799	31,051	308,748	238,863	-69,885	-273,442
Alaska	53,701	37,164	16,538	0	16,538	1,158	15,380	15,804	424	0
Arizona	724,188	488,874	235,314	1,146	236,460	19,442	217,018	165,786	-51,232	-216,484
Arkansas	421,186	286,320	134,866	0	134,866	18,009	116,856	118,299	1,443	-56,434
California	1,318,556	902,697	415,859	10,103	425,962	79,060	346,903	725,407	378,504	878,183
Colorado	346,716	235,233	111,484	0	111,484	12,322	99,162	120,501	21,339	24,826
Connecticut	285,655	193,764	91,892	5,299	97,191	7,205	89,985	95,434	5,448	-7,419
Delaware	84,730	56,328	28,402	0	28,402	2,284	26,118	32,685	6,568	16,049
Dist. of Col.	2,962	2,318	644	0	644	4,335	-3,690	35,197	38,887	105,560
Florida	1,470,348	968,249	502,099	0	502,099	43,749	458,350	571,483	113,134	291,712
Georgia	1,063,920	715,842	348,078	0	348,078	22,702	325,375	328,208	2,832	-51,954
Hawaii	66,504	45,382	21,122	0	21,122	1,828	19,295	31,348	12,053	0
Idaho	103,769	69,434	34,334	159	34,493	6,470	28,023	66,943	38,920	102,158
Illinois	1,556,529	1,061,226	495,304	0	495,304	41,566	453,737	430,700	-23,037	-228,546
Indiana	1,092,828	733,924	358,904	0	358,904	21,352	337,553	296,864	-40,688	-177,504
Iowa	363,370	249,061	114,309	0	114,309	9,367	104,942	117,035	12,093	-2,515
Kansas	420,901	290,459	130,442	0	130,442	13,882	116,561	103,578	-12,983	-101,539
Kentucky	868,011	574,028	293,983	0	293,983	11,456	282,527	254,358	-28,169	-83,745
Louisiana	714,248	490,574	223,674	0	223,674	18,237	205,438	248,486	43,049	51,912
Maine	28,568	19,463	9,105	16,058	25,163	2,415	22,748	39,447	16,699	44,527
Maryland	452,516	300,140	152,376	0	152,376	8,457	143,919	191,611	47,692	138,281
Massachusetts	276,260	184,232	92,027	5,299	97,326	11,535	85,791	158,693	72,902	197,026
Michigan	956,197	640,660	315,538	19,649	335,187	32,096	303,091	323,120	20,030	-19,303
Minnesota	472,945	327,925	145,020	16,364	161,384	19,780	141,604	184,107	42,504	45,259
Mississippi	298,181	208,121	90,060	0	90,060	8,666	81,395	129,207	47,813	100,205
Missouri	689,637	466,491	223,146	0	223,146	6,930	216,216	212,428	-3,788	-34,657
Montana	270,773	184,070	86,703	139	86,842	16,295	70,547	45,784	-24,763	-130,027
Nebraska	270,767	184,514	86,253	0	86,253	6,476	79,777	71,285	-8,491	-50,973
Nevada	218,368	150,137	68,231	149	68,380	2,773	65,607	70,490	4,883	-1,476
New Hampshire	148,436	100,886	47,550	5,299	52,849	2,616	50,233	30,733	-19,500	-69,691
New Jersey	290,572	198,149	92,423	0	92,423	15,980	76,443	227,764	151,321	411,695
New Mexico	308,902	208,480	100,422	0	100,422	5,867	94,555	56,010	-38,545	-136,206
New York	1,070,897	725,736	345,161	30,275	375,435	45,792	329,643	445,166	115,523	210,190
North Carolina	964,252	636,325	327,927	0	327,927	39,945	287,982	357,143	69,162	136,932
North Dakota	324,599	226,190	98,409	1,368	99,777	3,361	96,416	26,896	-69,521	-245,807
Ohio	1,399,415	929,036	470,379	0	470,379	39,142	431,237	541,230	109,994	269,366
Oklahoma	498,417	334,794	163,623	0	163,623	7,077	156,547	141,231	-15,316	-62,958
Oregon	453,546	303,311	150,235	5,710	155,945	5,449	150,496	156,015	5,519	10,238
Pennsylvania	1,742,995	1,166,566	576,429	0	576,429	28,956	547,473	430,767	-116,706	-414,806
Rhode Island	5,656	3,428	2,228	5,299	7,527	981	6,546	22,641	16,095	48,138
South Carolina	819,584	551,947	267,637	0	267,637	8,302	259,334	222,034	-37,301	-134,985
South Dakota	92,987	62,921	30,066	0	30,066	1,726	28,340	25,295	-3,045	-14,995
Tennessee	826,158	545,427	280,731	0	280,731	10,110	270,621	279,887	9,266	36,822
Texas	2,774,610	1,881,659	892,951	-3,157	889,794	52,372	837,422	898,307	60,885	4,690
Utah	329,809	220,280	109,529	0	109,529	681	108,848	62,986	-45,862	-135,602
Vermont	51,400	34,887	16,513	7,441	23,954	1,890	22,064	17,415	-4,649	-20,191
Virginia	541,377	361,471	179,906	0	179,906	11,627	168,279	290,574	122,295	354,554
Washington	993,110	666,679	326,431	-14,167	312,264	10,043	302,221	301,462	-759	-20,793
West Virginia	767,846	504,022	263,823	0	263,823	230	263,594	88,633	-174,961	-494,564
Wisconsin	545,360	371,306	174,054	15,905	189,960	5,027	184,933	197,783	12,850	16,397
Wyoming	425,903	290,503	135,401	0	135,401	531	134,870	38,209	-96,660	-308,092
United States	31,278,098	21,060,766	10,217,332	128,338	10,345,669	778,604	9,567,066	10,281,334	714,268	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1995 was 743,495 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A13. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1994
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	965,833	641,109	324,724	0	324,724	20,712	304,012	230,585	-73,426	-254,078
Alaska	52,289	36,041	16,248	0	16,248	1,194	15,055	15,468	413	0
Arizona	739,779	496,832	242,947	-8	242,939	11,376	231,563	161,326	-70,236	-241,782
Arkansas	424,304	289,367	134,937	0	134,937	8,565	126,372	111,296	-15,076	-80,762
California	1,374,506	942,038	432,468	12,696	445,164	72,399	372,765	729,091	356,326	825,193
Colorado	351,244	237,541	113,703	0	113,703	8,295	105,408	117,722	12,314	12,131
Connecticut	289,385	196,574	92,811	3,462	96,273	6,200	90,073	95,624	5,551	-4,687
Delaware	87,055	58,049	29,006	0	29,006	1,785	27,221	31,728	4,507	10,881
Dist. of Col.	4,131	3,195	936	0	936	1,946	-1,010	35,125	36,135	104,292
Florida	1,413,806	930,016	483,790	0	483,790	33,135	450,656	544,365	93,710	266,502
Georgia	1,004,816	667,872	336,944	0	336,944	20,583	316,362	306,783	-9,578	-57,858
Hawaii	64,666	44,006	20,660	0	20,660	1,947	18,713	30,532	11,819	0
Idaho	75,340	50,421	24,918	642	25,560	6,268	19,292	67,826	48,534	132,080
Illinois	1,491,277	1,021,289	469,988	0	469,988	30,906	439,081	414,524	-24,557	-211,753
Indiana	1,080,939	727,847	353,092	0	353,092	16,524	336,569	285,951	-50,617	-198,284
Iowa	349,757	240,697	109,060	0	109,060	7,139	101,921	112,730	10,809	-1,790
Kansas	414,597	287,385	127,213	0	127,213	8,195	119,017	101,042	-17,975	-102,707
Kentucky	851,210	564,271	286,939	0	286,939	16,903	270,036	247,320	-22,716	-87,800
Louisiana	653,797	448,498	205,300	0	205,300	12,320	192,980	239,290	46,310	84,825
Maine	96,277	65,516	30,761	10,655	41,416	2,274	39,142	39,599	457	-6,259
Maryland	450,600	301,272	149,328	0	149,328	10,049	139,279	186,813	47,534	126,040
Massachusetts	278,047	184,333	93,714	13,916	107,630	9,255	98,375	157,264	58,889	165,310
Michigan	854,390	568,735	285,655	23,767	309,421	22,124	287,298	311,038	23,740	33,843
Minnesota	456,526	316,916	139,610	24,099	163,709	12,014	151,695	174,541	22,846	9,374
Mississippi	289,843	200,373	89,471	0	89,471	11,882	77,589	124,970	47,381	95,905
Missouri	651,831	441,928	209,903	0	209,903	16,547	193,356	203,672	10,316	-23,152
Montana	263,598	179,304	84,294	410	84,704	5,572	79,131	44,984	-34,147	-125,983
Nebraska	236,854	161,976	74,878	0	74,878	6,256	68,622	67,807	-815	-27,551
Nevada	229,847	159,836	70,011	39	70,051	4,553	65,498	68,364	2,866	-18,946
New Hampshire	126,875	86,313	40,562	3,715	44,277	2,799	41,478	30,559	-10,919	-43,779
New Jersey	349,007	240,057	108,951	0	108,951	13,164	95,786	226,071	130,284	348,812
New Mexico	312,044	209,623	102,421	0	102,421	3,947	98,475	54,110	-44,365	-145,020
New York	1,094,816	740,777	354,039	42,468	396,507	38,811	357,696	447,574	89,879	158,327
North Carolina	918,795	606,751	312,044	0	312,044	21,140	290,904	340,481	49,577	132,177
North Dakota	326,334	227,374	98,961	2,477	101,438	3,162	98,275	26,207	-72,069	-252,930
Ohio	1,315,856	875,638	440,218	0	440,218	33,040	407,178	526,733	119,555	310,028
Oklahoma	474,702	319,863	154,839	0	154,839	10,299	144,539	140,381	-4,158	-41,382
Oregon	387,114	259,198	127,916	13,552	141,468	11,993	129,475	153,440	23,965	45,540
Pennsylvania	1,744,460	1,167,733	576,727	0	576,727	29,472	547,255	419,830	-127,425	-448,559
Rhode Island	1,067	833	234	1,883	2,117	1,159	959	22,423	21,465	62,454
South Carolina	774,301	521,153	253,149	0	253,149	11,536	241,613	211,059	-30,553	-122,818
South Dakota	84,448	57,182	27,266	1,207	28,473	1,995	26,478	24,478	-2,000	-12,539
Tennessee	756,713	501,312	255,400	0	255,400	23,881	231,519	281,604	50,084	112,522
Texas	2,702,504	1,831,964	870,540	-3,292	867,248	54,095	813,153	880,909	67,757	26,577
Utah	349,007	231,447	117,561	0	117,561	5,981	111,580	60,894	-50,686	-161,043
Vermont	56,346	38,283	18,063	4,207	22,270	2,486	19,784	17,287	-2,497	-15,706
Virginia	540,268	360,346	179,923	0	179,923	18,024	161,899	280,501	118,602	325,562
Washington	852,366	571,396	280,970	-7,610	273,360	21,367	251,992	297,299	45,307	88,325
West Virginia	762,464	497,343	265,122	0	265,122	6,814	258,307	84,535	-173,773	-501,529
Wisconsin	528,330	359,649	168,681	4,022	172,703	12,565	160,138	189,064	28,927	43,101
Wyoming	454,320	309,865	144,454	0	144,454	3,721	140,733	39,908	-100,825	-331,134
United States	30,408,684	20,477,334	9,931,350	152,304	10,083,654	718,369	9,365,285	10,012,728	647,444	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1994 was 698,395 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A14. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1993
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	954,841	633,692	321,150	0	321,150	23,753	297,397	221,977	-75,420	-263,872
Alaska	51,195	35,564	15,631	0	15,631	1,195	14,436	14,926	491	0
Arizona	705,866	473,765	232,101	-8	232,094	12,015	220,078	151,520	-68,559	-234,193
Arkansas	406,107	276,284	129,823	0	129,823	7,765	122,059	108,034	-14,025	-69,819
California	1,388,097	958,928	429,168	11,925	441,093	69,463	371,630	718,226	346,596	802,266
Colorado	345,627	234,098	111,529	0	111,529	7,492	104,037	112,452	8,415	4,414
Connecticut	304,961	206,986	97,975	3,670	101,646	7,447	94,198	92,938	-1,261	-26,754
Delaware	88,170	59,829	28,342	0	28,342	1,821	26,520	31,121	4,601	8,704
Dist. of Col.	2,984	2,341	643	0	643	2,075	-1,432	35,398	36,830	107,204
Florida	1,414,936	937,028	477,908	0	477,908	35,172	442,736	521,176	78,439	207,379
Georgia	961,660	635,003	326,656	0	326,656	16,594	310,062	304,320	-5,742	-14,373
Hawaii	66,172	45,414	20,758	0	20,758	1,925	18,833	29,541	10,708	0
Idaho	93,015	62,230	30,785	449	31,235	6,009	25,225	63,872	38,647	104,449
Illinois	1,524,836	1,046,879	477,956	0	477,956	32,154	445,803	401,887	-43,916	-273,842
Indiana	1,042,034	701,000	341,033	0	341,033	15,986	325,047	279,550	-45,497	-171,850
Iowa	335,310	229,567	105,744	0	105,744	6,791	98,953	109,539	10,586	5,661
Kansas	404,593	280,285	124,308	0	124,308	7,624	116,684	98,294	-18,389	-98,623
Kentucky	858,999	568,986	290,012	0	290,012	14,575	275,437	232,525	-42,912	-135,195
Louisiana	641,073	438,562	202,511	0	202,511	14,440	188,071	231,183	43,112	78,553
Maine	86,302	58,747	27,555	7,328	34,883	1,162	33,721	40,781	7,061	18,501
Maryland	447,806	299,424	148,382	0	148,382	10,866	137,516	183,813	46,297	124,366
Massachusetts	285,386	189,292	96,094	6,277	102,371	10,448	91,923	154,498	62,575	176,570
Michigan	953,388	638,630	314,757	3,179	317,936	21,614	296,322	298,852	2,530	-32,725
Minnesota	449,778	309,019	140,759	21,789	162,548	12,134	150,414	167,907	17,493	7,050
Mississippi	252,963	173,688	79,275	0	79,275	12,760	66,515	118,565	52,050	116,105
Missouri	567,064	385,537	181,526	0	181,526	16,828	164,698	200,018	35,321	55,554
Montana	250,540	170,538	80,002	102	80,105	5,697	74,407	44,115	-30,293	-113,530
Nebraska	244,347	166,811	77,535	0	77,535	6,282	71,253	63,972	-7,282	-45,215
Nevada	212,414	144,787	67,627	112	67,739	3,655	64,085	63,118	-967	-16,280
New Hampshire	157,066	107,299	49,767	3,670	53,438	2,204	51,233	29,892	-21,341	-75,107
New Jersey	371,778	254,799	116,979	0	116,979	17,444	99,535	223,898	124,363	325,171
New Mexico	300,314	203,535	96,779	0	96,779	4,502	92,277	50,931	-41,347	-141,778
New York	1,117,992	755,247	362,745	23,342	386,087	38,930	347,157	444,141	96,984	194,004
North Carolina	887,274	584,447	302,827	0	302,827	22,176	280,651	340,441	59,790	172,450
North Dakota	321,011	223,770	97,241	4,855	102,096	3,099	98,997	25,358	-73,639	-256,746
Ohio	1,355,562	899,257	456,305	0	456,305	33,369	422,936	506,923	83,987	222,388
Oklahoma	508,752	342,210	166,542	0	166,542	10,586	155,956	138,293	-17,663	-78,274
Oregon	417,703	278,687	139,015	11,234	150,249	12,192	138,057	152,100	14,042	21,812
Pennsylvania	1,700,848	1,133,772	567,077	0	567,077	31,406	535,670	409,377	-126,293	-426,540
Rhode Island	853	669	183	3,670	3,854	1,156	2,698	22,343	19,645	57,608
South Carolina	790,325	532,418	257,908	0	257,908	12,510	245,398	209,950	-35,448	-136,794
South Dakota	55,670	37,738	17,932	0	17,932	1,909	16,023	23,559	7,536	17,664
Tennessee	709,816	465,468	244,348	0	244,348	27,587	216,761	272,387	55,627	138,072
Texas	2,601,978	1,755,208	846,771	-2,733	844,037	60,678	783,360	853,288	69,928	62,395
Utah	340,125	225,956	114,169	0	114,169	5,598	108,571	57,551	-51,020	-160,981
Vermont	45,696	31,023	14,673	9,213	23,887	1,985	21,902	17,114	-4,788	-20,263
Virginia	531,171	353,127	178,045	0	178,045	18,595	159,450	277,641	118,191	333,068
Washington	868,070	582,243	285,827	-11,082	274,745	23,948	250,796	308,693	57,896	126,312
West Virginia	699,908	457,390	242,518	0	242,518	6,836	235,683	83,394	-152,288	-440,318
Wisconsin	513,343	350,376	162,967	0	162,967	12,304	150,663	181,370	30,706	51,225
Wyoming	432,136	295,129	137,007	0	137,007	3,772	133,235	40,552	-92,683	-305,905
United States	30,067,855	20,232,681	9,835,175	96,994	9,932,168	738,530	9,193,638	9,763,310	569,672	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1993 was 639,634 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A15. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1992
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	920,265	610,482	309,783	0	309,783	21,144	288,639	212,113	-76,527	-255,080
Alaska	47,293	33,075	14,218	0	14,218	1,158	13,060	14,804	1,745	0
Arizona	733,687	494,475	239,212	-7	239,204	11,727	227,477	148,938	-78,539	-266,594
Arkansas	397,722	270,216	127,506	0	127,506	7,724	119,782	97,075	-22,707	-93,294
California	1,327,432	920,347	407,085	15,349	422,434	74,749	347,685	728,282	380,597	900,529
Colorado	336,576	227,736	108,840	0	108,840	9,296	99,545	108,577	9,032	3,920
Connecticut	265,578	179,753	85,824	3,260	89,084	6,493	82,592	92,557	9,965	14,800
Delaware	78,379	56,995	21,385	0	21,385	1,709	19,676	29,112	9,437	12,918
Dist. of Col.	1,546	1,294	252	0	252	1,838	-1,586	34,267	35,853	105,915
Florida	1,376,208	919,079	457,129	0	457,129	35,172	421,957	501,598	79,641	196,803
Georgia	926,563	613,412	313,151	0	313,151	16,950	296,201	284,532	-11,670	-34,272
Hawaii	74,573	51,162	23,411	0	23,411	1,938	21,472	29,571	8,099	0
Idaho	64,743	43,383	21,359	887	22,246	6,125	16,121	64,856	48,735	135,958
Illinois	1,350,551	924,651	425,900	0	425,900	30,000	395,900	383,920	-11,980	-146,578
Indiana	1,014,679	682,693	331,986	0	331,986	16,347	315,640	262,645	-52,995	-191,025
Iowa	321,787	221,383	100,404	0	100,404	9,090	91,314	103,070	11,756	1,440
Kansas	355,240	246,862	108,378	0	108,378	6,739	101,639	92,360	-9,279	-65,600
Kentucky	777,428	513,505	263,922	0	263,922	12,297	251,625	228,835	-22,790	-59,800
Louisiana	594,693	406,391	188,302	0	188,302	13,281	175,021	222,116	47,095	101,861
Maine	89,006	60,567	28,439	7,244	35,682	2,500	33,183	39,180	5,998	11,906
Maryland	406,134	271,064	135,069	0	135,069	9,830	125,239	173,974	48,735	139,448
Massachusetts	331,793	219,749	112,044	5,844	117,888	10,890	106,998	153,533	46,536	131,975
Michigan	848,555	566,453	282,102	-627	281,475	21,648	259,827	286,063	26,236	50,439
Minnesota	422,999	294,081	128,919	16,849	145,768	10,555	135,213	161,770	26,557	33,242
Mississippi	228,091	158,186	69,905	0	69,905	11,565	58,339	113,419	55,079	127,591
Missouri	596,490	403,278	193,212	0	193,212	15,192	178,020	185,650	7,630	-14,292
Montana	271,007	184,111	86,896	129	87,025	6,168	80,857	44,685	-36,172	-131,267
Nebraska	241,373	164,987	76,385	0	76,385	5,909	70,476	60,680	-9,796	-51,080
Nevada	224,028	152,502	71,526	133	71,659	4,306	67,353	60,380	-6,973	-35,082
New Hampshire	142,351	96,456	45,895	3,260	49,156	1,136	48,019	30,552	-17,467	-56,421
New Jersey	339,287	232,947	106,340	0	106,340	16,505	89,836	215,373	125,538	336,124
New Mexico	292,259	197,721	94,538	0	94,538	3,821	90,717	49,240	-41,477	-137,842
New York	1,179,624	796,699	382,925	13,255	396,180	35,298	360,882	438,339	77,457	154,828
North Carolina	831,866	548,646	283,221	0	283,221	20,732	262,489	321,394	58,906	176,027
North Dakota	322,083	224,526	97,557	2,332	99,889	3,525	96,364	24,322	-72,042	-252,877
Ohio	1,376,582	911,538	465,044	0	465,044	32,190	432,854	494,796	61,942	175,099
Oklahoma	478,421	321,664	156,757	0	156,757	9,705	147,052	130,568	-16,484	-68,961
Oregon	427,386	286,742	140,644	21,085	161,729	12,590	149,139	146,410	-2,729	-32,156
Pennsylvania	1,684,021	1,117,512	566,509	0	566,509	25,219	541,290	396,773	-144,516	-439,740
Rhode Island	1,595	1,222	373	3,260	3,633	1,008	2,625	21,811	19,187	56,924
South Carolina	749,731	505,846	243,885	0	243,885	11,493	232,392	199,264	-33,129	-124,839
South Dakota	66,505	45,192	21,313	986	22,299	1,845	20,454	22,157	1,703	-9
Tennessee	761,612	504,360	257,252	0	257,252	24,687	232,564	268,129	35,565	79,241
Texas	2,551,489	1,732,732	818,757	-3,284	815,473	56,085	759,388	816,939	57,551	20,384
Utah	332,833	220,508	112,326	0	112,326	5,849	106,476	56,527	-49,950	-155,565
Vermont	50,002	33,972	16,030	5,005	21,034	2,071	18,964	16,859	-2,105	-12,302
Virginia	500,948	333,884	167,064	0	167,064	17,305	149,759	260,842	111,083	317,053
Washington	873,845	586,845	287,000	-1,522	285,478	22,326	263,152	304,758	41,606	86,488
West Virginia	708,957	462,154	246,803	0	246,803	6,811	239,993	81,312	-158,681	-453,963
Wisconsin	501,118	342,583	158,534	3,286	161,821	12,189	149,631	173,756	24,125	33,821
Wyoming	451,259	308,458	142,800	0	142,800	3,941	138,859	39,920	-98,939	-326,069
United States	29,248,191	19,704,080	9,544,112	96,724	9,640,836	708,672	8,932,165	9,428,603	496,438	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1992 was 560,844 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A16. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1991
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	861,747	571,553	290,193	0	290,193	17,609	272,584	208,908	-63,676	-198,072
Alaska	50,016	35,391	14,625	0	14,625	1,262	13,363	14,520	1,158	0
Arizona	702,238	474,427	227,810	363	228,173	12,223	215,950	142,787	-73,164	-249,731
Arkansas	411,599	280,697	130,902	0	130,902	7,073	123,829	97,038	-26,791	-103,321
California	1,191,724	833,573	358,151	21,681	379,831	68,964	310,867	711,915	401,048	995,849
Colorado	328,386	222,483	105,902	0	105,902	7,639	98,263	107,330	9,067	12,590
Connecticut	249,132	168,772	80,360	622	80,982	5,910	75,072	92,709	17,637	43,490
Delaware	91,741	65,797	25,944	0	25,944	1,843	24,101	29,124	5,023	784
Dist. of Col.	3,097	2,484	614	0	614	2,279	-1,666	34,786	36,451	107,413
Florida	1,345,106	899,008	446,098	0	446,098	34,513	411,586	499,299	87,713	241,107
Georgia	923,120	613,279	309,842	0	309,842	16,241	293,601	278,211	-15,389	-39,276
Hawaii	79,242	54,221	25,021	0	25,021	1,547	23,474	29,084	5,610	0
Idaho	86,428	58,171	28,256	456	28,713	5,087	23,626	61,572	37,946	107,783
Illinois	1,399,503	963,274	436,229	0	436,229	31,146	405,083	398,756	-6,328	-132,705
Indiana	1,027,106	692,048	335,058	0	335,058	16,532	318,526	262,839	-55,687	-192,098
Iowa	340,029	233,479	106,550	0	106,550	8,035	98,515	105,026	6,511	-6,373
Kansas	364,005	253,747	110,258	0	110,258	7,509	102,749	96,055	-6,694	-58,849
Kentucky	765,903	508,280	257,623	0	257,623	10,750	246,873	219,029	-27,844	-70,073
Louisiana	619,365	424,342	195,023	0	195,023	12,872	182,151	220,771	38,620	81,998
Maine	102,491	70,014	32,477	7,169	39,647	2,570	37,076	38,838	1,762	-1,036
Maryland	397,199	266,809	130,390	0	130,390	11,175	119,215	174,380	55,164	156,785
Massachusetts	359,053	236,896	122,158	6,443	128,600	11,143	117,457	152,847	35,389	106,816
Michigan	976,777	654,113	322,664	-1,467	321,197	21,628	299,570	288,377	-11,193	-56,152
Minnesota	437,765	299,826	137,939	7,304	145,242	9,702	135,541	166,351	30,810	68,372
Mississippi	255,938	176,421	79,517	0	79,517	9,059	70,458	112,662	42,204	101,976
Missouri	633,135	428,003	205,132	0	205,132	15,746	189,386	192,826	3,440	-20,549
Montana	299,852	203,779	96,073	89	96,162	5,640	90,522	45,743	-44,778	-154,804
Nebraska	246,604	168,224	78,380	0	78,380	5,633	72,747	63,481	-9,267	-44,933
Nevada	225,228	153,841	71,387	11	71,398	3,840	67,559	56,726	-10,833	-45,050
New Hampshire	135,189	91,839	43,350	3,030	46,380	2,027	44,353	29,895	-14,458	-49,483
New Jersey	404,876	278,533	126,343	0	126,343	16,432	109,911	220,697	110,786	296,251
New Mexico	264,348	178,827	85,520	0	85,520	3,753	81,767	48,054	-33,713	-111,685
New York	1,323,345	893,171	430,174	12,085	442,259	34,975	407,284	441,550	34,266	42,443
North Carolina	845,739	560,768	284,970	0	284,970	20,327	264,643	314,984	50,340	154,927
North Dakota	311,703	217,753	93,950	1,562	95,512	3,300	92,212	24,755	-67,457	-237,839
Ohio	1,356,073	903,322	452,751	0	452,751	32,209	420,542	496,986	76,444	222,793
Oklahoma	469,008	315,980	153,029	0	153,029	9,730	143,298	134,448	-8,850	-41,884
Oregon	483,965	325,997	157,969	12,278	170,247	11,517	158,730	148,936	-9,794	-48,366
Pennsylvania	1,661,622	1,107,626	553,996	0	553,996	31,465	522,531	396,942	-125,589	-400,585
Rhode Island	2,573	1,988	585	622	1,207	1,141	66	21,847	21,782	64,930
South Carolina	734,526	496,239	238,287	0	238,287	11,460	226,828	194,721	-32,107	-115,922
South Dakota	71,302	48,876	22,426	472	22,898	1,938	20,959	22,810	1,850	-282
Tennessee	757,163	504,908	252,255	0	252,255	16,917	235,338	267,467	32,129	92,548
Texas	2,546,229	1,733,002	813,228	-1,525	811,703	52,361	759,342	820,080	60,738	63,730
Utah	310,510	207,609	102,901	0	102,901	5,385	97,515	54,276	-43,239	-138,081
Vermont	56,247	38,304	17,943	7,524	25,467	2,232	23,235	16,052	-7,183	-28,266
Virginia	504,361	337,375	166,986	0	166,986	17,478	149,508	256,279	106,771	309,808
Washington	1,059,648	713,831	345,817	-4,619	341,198	22,574	318,624	316,338	-2,285	-40,551
West Virginia	695,070	451,951	243,119	0	243,119	6,890	236,229	80,608	-155,621	-438,987
Wisconsin	508,962	348,090	160,872	1,892	162,764	11,943	150,820	174,122	23,301	38,416
Wyoming	413,252	281,320	131,932	0	131,932	3,873	128,059	40,114	-87,945	-285,814
United States	29,689,242	20,050,264	9,638,978	75,993	9,714,971	685,094	9,029,877	9,423,954	394,078	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1991 was 440,551 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A17. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1990
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	773,921	513,818	260,103	0	260,103	16,542	243,560	204,466	-39,094	-122,240
Alaska	53,204	37,874	15,330	0	15,330	1,310	14,020	14,514	494	0
Arizona	656,419	443,889	212,530	-7	212,523	13,688	198,834	141,494	-57,340	-205,423
Arkansas	399,422	272,995	126,426	0	126,426	7,066	119,360	93,370	-25,990	-101,829
California	1,292,178	901,409	390,770	15,924	406,693	78,954	327,740	720,249	392,509	949,118
Colorado	331,334	224,495	106,840	0	106,840	7,630	99,209	105,071	5,862	3,552
Connecticut	339,721	230,006	109,715	612	110,327	6,259	104,069	92,763	-11,306	-45,931
Delaware	86,611	62,387	24,224	0	24,224	1,332	22,893	28,265	5,372	3,475
Dist. of Col.	5,441	4,209	1,232	0	1,232	1,445	-213	33,603	33,816	101,659
Florida	1,274,201	852,396	421,805	0	421,805	30,366	391,438	489,741	98,303	286,717
Georgia	981,182	648,290	332,892	0	332,892	16,053	316,839	274,462	-42,377	-106,410
Hawaii	86,114	58,831	27,283	0	27,283	1,709	25,574	28,356	2,782	0
Idaho	89,647	60,242	29,405	310	29,715	5,797	23,918	61,428	37,510	105,191
Illinois	1,381,867	948,620	433,247	0	433,247	30,452	402,794	380,700	-22,094	-168,488
Indiana	1,026,095	692,611	333,484	0	333,484	16,442	317,042	252,427	-64,615	-221,551
Iowa	318,102	218,990	99,112	0	99,112	7,632	91,479	100,440	8,961	2,025
Kansas	380,811	265,251	115,560	0	115,560	7,987	107,573	92,632	-14,942	-85,572
Kentucky	747,938	496,108	251,830	0	251,830	9,561	242,269	208,463	-33,807	-83,520
Louisiana	626,383	427,913	198,471	0	198,471	12,780	185,690	217,774	32,083	67,712
Maine	96,213	65,288	30,925	7,976	38,901	2,278	36,623	39,337	2,714	4,847
Maryland	326,041	218,572	107,469	0	107,469	8,433	99,037	169,009	69,973	212,630
Massachusetts	375,723	251,258	124,465	7,043	131,508	11,096	120,412	155,047	34,635	96,975
Michigan	915,227	611,359	303,868	-37,255	266,613	21,731	244,881	281,036	36,154	94,077
Minnesota	448,114	306,346	141,767	302	142,070	10,783	131,286	160,934	29,647	63,897
Mississippi	252,009	173,793	78,217	0	78,217	8,240	69,977	109,618	39,641	97,367
Missouri	616,679	415,334	201,345	0	201,345	15,398	185,947	183,991	-1,956	-30,258
Montana	273,667	185,914	87,753	155	87,908	6,557	81,351	44,781	-36,570	-131,411
Nebraska	233,262	159,459	73,804	0	73,804	5,837	67,967	60,966	-7,001	-38,948
Nevada	208,150	142,346	65,805	0	65,805	4,074	61,731	55,793	-5,938	-30,326
New Hampshire	114,704	77,819	36,884	612	37,497	1,810	35,687	30,638	-5,048	-18,919
New Jersey	396,449	271,950	124,499	0	124,499	15,553	108,946	214,467	105,521	287,106
New Mexico	303,535	206,323	97,212	0	97,212	3,769	93,443	47,156	-46,286	-153,237
New York	1,351,639	912,667	438,972	1,564	440,535	30,024	410,512	441,255	30,743	49,976
North Carolina	805,452	533,020	272,432	0	272,432	15,209	257,223	306,822	49,600	172,462
North Dakota	304,535	213,010	91,525	2,233	93,758	3,216	90,542	23,931	-66,611	-235,069
Ohio	1,284,038	852,387	431,652	0	431,652	31,612	400,039	486,092	86,053	265,249
Oklahoma	470,141	316,386	153,756	0	153,756	10,249	143,506	145,024	1,518	-7,915
Oregon	513,027	345,253	167,775	7,400	175,175	12,825	162,349	146,639	-15,710	-68,214
Pennsylvania	1,696,555	1,131,245	565,310	0	565,310	27,191	538,119	391,529	-146,590	-448,661
Rhode Island	7,909	5,890	2,019	612	2,631	1,127	1,504	21,902	20,397	60,030
South Carolina	725,315	489,001	236,314	0	236,314	8,831	227,483	189,884	-37,599	-120,111
South Dakota	69,941	48,010	21,931	0	21,931	1,832	20,099	21,611	1,512	-1,061
Tennessee	748,822	496,666	252,156	0	252,156	15,058	237,098	263,218	26,120	90,114
Texas	2,511,451	1,711,397	800,054	-217	799,837	50,440	749,397	810,060	60,663	71,058
Utah	321,136	211,063	110,072	0	110,072	5,495	104,577	52,551	-52,027	-153,645
Vermont	52,963	35,928	17,035	3,971	21,006	1,858	19,148	16,092	-3,056	-13,780
Virginia	486,603	325,555	161,048	0	161,048	16,528	144,520	248,040	103,520	303,956
Washington	1,049,316	706,482	342,834	-4,479	338,355	24,105	314,249	310,649	-3,600	-45,549
West Virginia	750,732	486,767	263,965	0	263,965	6,491	257,474	78,928	-178,546	-499,171
Wisconsin	493,048	337,628	155,420	0	155,420	11,484	143,936	167,864	23,927	41,972
Wyoming	421,912	287,554	134,358	0	134,358	4,156	130,202	40,155	-90,047	-293,928
United States	29,474,900	19,892,005	9,582,895	6,756	9,589,652	666,295	8,923,356	9,255,237	331,880	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1990 was 362,436 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A18. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1989
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	790,079	525,307	264,772	0	264,772	16,563	248,210	198,535	-49,674	-145,471
Alaska	51,157	36,187	14,970	0	14,970	1,405	13,565	14,131	567	0
Arizona	564,047	382,783	181,264	-7	181,257	13,482	167,775	139,031	-28,744	-112,617
Arkansas	355,394	241,435	113,959	0	113,959	7,441	106,518	89,002	-17,516	-66,421
California	1,484,819	1,033,533	451,286	14,424	465,710	71,806	393,904	696,521	302,617	726,874
Colorado	341,042	230,837	110,205	0	110,205	7,848	102,356	102,834	478	-7,156
Connecticut	363,733	246,781	116,952	777	117,729	6,895	110,834	93,368	-17,466	-62,960
Delaware	90,350	61,492	28,858	0	28,858	2,014	26,844	27,519	675	-1,001
Dist. of Col.	9,268	7,049	2,219	0	2,219	2,301	-83	32,935	33,018	97,667
Florida	1,286,046	862,089	423,956	0	423,956	38,618	385,338	472,473	87,135	247,989
Georgia	936,117	620,682	315,434	0	315,434	16,940	298,495	262,928	-35,567	-82,438
Hawaii	85,821	58,700	27,122	0	27,122	1,733	25,389	27,195	1,806	0
Idaho	93,150	62,684	30,465	97	30,562	5,395	25,167	60,806	35,639	103,979
Illinois	1,373,765	940,982	432,783	0	432,783	31,982	400,801	372,935	-27,865	-162,911
Indiana	920,335	618,159	302,176	0	302,176	17,556	284,620	248,703	-35,916	-112,840
Iowa	304,997	209,189	95,808	0	95,808	7,438	88,369	97,967	9,597	13,084
Kansas	386,539	269,733	116,807	0	116,807	7,902	108,905	88,105	-20,800	-100,479
Kentucky	716,724	475,290	241,434	0	241,434	10,497	230,937	199,558	-31,379	-68,796
Louisiana	584,500	399,254	185,245	0	185,245	13,584	171,661	211,003	39,342	100,590
Maine	123,819	84,157	39,662	7,101	46,763	2,778	43,985	39,013	-4,972	-18,861
Maryland	371,064	249,055	122,009	0	122,009	12,358	109,651	168,071	58,419	174,631
Massachusetts	397,752	264,146	133,606	7,027	140,633	12,632	128,001	155,871	27,870	86,847
Michigan	933,048	620,789	312,259	-18,514	293,745	22,517	271,228	282,955	11,727	42,262
Minnesota	434,702	296,935	137,767	-1,460	136,307	11,385	124,922	156,719	31,797	78,602
Mississippi	228,746	156,906	71,839	0	71,839	8,639	63,200	100,908	37,708	98,884
Missouri	615,167	412,555	202,612	0	202,612	16,599	186,013	179,480	-6,533	-32,428
Montana	274,844	186,737	88,107	52	88,159	5,753	82,407	44,564	-37,843	-130,311
Nebraska	228,406	156,451	71,955	0	71,955	5,836	66,119	59,938	-6,182	-33,799
Nevada	213,868	146,717	67,151	246	67,396	3,359	64,037	51,071	-12,966	-48,801
New Hampshire	74,616	50,305	24,311	630	24,941	2,770	22,171	31,001	8,830	24,111
New Jersey	449,699	309,314	140,384	0	140,384	17,379	123,005	216,179	93,174	252,196
New Mexico	309,615	212,890	96,726	0	96,726	3,587	93,139	45,618	-47,521	-161,503
New York	1,369,691	924,581	445,110	15,505	460,615	35,682	424,933	437,430	12,498	3,160
North Carolina	880,327	583,130	297,196	0	297,196	23,363	273,834	300,970	27,136	96,869
North Dakota	290,451	202,746	87,705	187	87,892	3,390	84,501	24,095	-60,407	-212,791
Ohio	1,342,391	893,945	448,446	0	448,446	31,504	416,941	483,222	66,281	226,544
Oklahoma	465,558	313,901	151,657	0	151,657	11,128	140,529	126,269	-14,260	-55,584
Oregon	470,657	317,242	153,416	7,272	160,687	12,001	148,686	142,004	-6,682	-31,828
Pennsylvania	1,584,485	1,056,340	528,144	0	528,144	31,657	496,487	388,626	-107,861	-322,685
Rhode Island	6,682	4,989	1,693	326	2,019	1,278	741	21,698	20,957	62,770
South Carolina	701,824	473,273	228,551	0	228,551	12,884	215,667	183,761	-31,906	-105,186
South Dakota	76,125	52,294	23,831	0	23,831	1,969	21,862	21,626	-236	-5,910
Tennessee	751,815	499,467	252,348	0	252,348	16,963	235,385	256,285	20,900	80,296
Texas	2,471,949	1,679,070	792,879	-199	792,680	59,663	733,017	783,601	50,583	72,870
Utah	303,915	199,863	104,052	1	104,052	5,088	98,964	51,059	-47,904	-138,136
Vermont	50,817	34,573	16,244	6,669	22,913	59	22,854	15,603	-7,251	-20,547
Virginia	446,512	298,570	147,943	0	147,943	18,032	129,910	250,650	120,739	367,303
Washington	913,048	615,791	297,257	-2,684	294,573	22,548	272,025	295,733	23,708	55,350
West Virginia	810,419	527,701	282,718	0	282,718	7,223	275,495	77,955	-197,540	-557,312
Wisconsin	481,534	330,173	151,361	0	151,361	11,724	139,637	165,059	25,422	54,381
Wyoming	392,945	267,551	125,394	0	125,394	3,697	121,697	38,329	-83,368	-268,498
United States	29,204,373	19,704,326	9,500,047	37,450	9,537,496	716,846	8,820,650	9,030,913	210,263	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity sold by nonutilities to utilities for distribution in 1989 was 277,153 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A19. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1988
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	685,072	454,700	230,372	0	230,372	14,771	215,601	193,247	-22,354	-54,938
Alaska	49,172	34,860	14,313	0	14,313	1,292	13,020	13,801	781	0
Arizona	650,901	440,850	210,051	-6	210,044	13,429	196,615	132,783	-63,833	-217,909
Arkansas	361,689	246,487	115,202	0	115,202	7,543	107,659	86,230	-21,429	-80,513
California	1,439,577	1,009,730	429,848	24,859	454,707	74,441	380,266	684,574	304,308	717,442
Colorado	328,838	223,424	105,414	0	105,414	7,588	97,826	100,091	2,265	-2,464
Connecticut	384,817	260,693	124,124	2,313	126,436	7,213	119,223	91,862	-27,361	-92,274
Delaware	94,795	64,249	30,546	0	30,546	1,673	28,873	25,738	-3,135	-10,870
Dist. of Col.	6,842	5,243	1,600	0	1,600	1,978	-378	32,003	32,382	97,512
Florida	1,279,179	855,909	423,270	0	423,270	32,120	391,150	444,382	53,232	169,847
Georgia	833,533	552,470	281,063	0	281,063	15,297	265,766	253,669	-12,097	-6,375
Hawaii	81,909	55,884	26,025	0	26,025	1,627	24,398	26,337	1,939	0
Idaho	69,644	46,627	23,016	342	23,359	5,131	18,227	58,568	40,341	120,298
Illinois	1,332,747	911,912	420,835	0	420,835	31,030	389,805	375,459	-14,346	-108,461
Indiana	880,198	593,748	286,450	0	286,450	17,452	268,998	244,557	-24,441	-82,755
Iowa	304,442	209,829	94,613	0	94,613	7,652	86,961	98,394	11,433	16,398
Kansas	356,741	249,654	107,087	0	107,087	7,728	99,359	88,128	-11,231	-69,377
Kentucky	760,254	499,454	260,800	0	260,800	10,475	250,325	184,515	-65,810	-158,594
Louisiana	614,573	420,861	193,711	0	193,711	12,686	181,026	204,757	23,731	53,091
Maine	100,915	68,399	32,516	11,559	44,075	2,582	41,493	38,432	-3,061	-10,570
Maryland	418,244	280,453	137,792	0	137,792	11,647	126,145	162,288	36,143	110,940
Massachusetts	347,404	229,130	118,274	9,798	128,072	11,881	116,191	152,608	36,417	120,569
Michigan	912,784	609,567	303,218	561	303,779	23,016	280,762	281,548	786	3,582
Minnesota	430,262	292,922	137,340	-5,695	131,645	11,248	120,397	156,022	35,625	95,721
Mississippi	267,440	181,824	85,616	0	85,616	8,436	77,180	95,807	18,628	44,966
Missouri	622,007	418,175	203,832	0	203,832	16,298	187,534	178,267	-9,267	-40,720
Montana	263,712	179,022	84,690	10	84,690	5,460	79,239	44,156	-35,082	-119,757
Nebraska	223,600	153,193	70,407	0	70,407	5,769	64,638	58,886	-5,752	-31,585
Nevada	219,106	149,855	69,250	0	69,250	3,532	65,718	46,691	-19,027	-66,858
New Hampshire	73,080	49,204	23,875	2,459	26,334	2,596	23,739	30,190	6,451	17,921
New Jersey	438,104	301,078	137,025	0	137,025	17,999	119,026	211,925	92,899	252,935
New Mexico	288,161	198,189	89,972	0	89,972	3,862	86,109	43,521	-42,588	-146,248
New York	1,300,960	875,437	425,523	41,604	467,128	32,992	434,136	428,694	-5,442	-28,973
North Carolina	793,545	526,025	267,521	0	267,521	21,020	246,501	291,863	45,363	158,154
North Dakota	305,281	211,958	93,323	1,329	94,652	3,454	91,198	24,248	-66,950	-230,234
Ohio	1,266,079	842,874	423,205	0	423,205	30,553	392,652	458,286	65,635	228,287
Oklahoma	462,868	312,619	150,249	0	150,249	9,803	140,446	127,356	-13,090	-47,589
Oregon	426,814	286,758	140,055	5,578	145,633	11,498	134,135	134,133	-2	-6,313
Pennsylvania	1,559,243	1,037,438	521,806	0	521,806	31,674	490,132	385,186	-104,946	-303,242
Rhode Island	9,841	7,234	2,607	2,313	4,919	1,436	3,483	21,221	17,738	52,360
South Carolina	681,298	458,895	222,403	0	222,403	11,830	210,573	180,183	-30,390	-93,763
South Dakota	85,086	58,180	26,906	0	26,906	1,920	24,986	21,273	-3,714	-15,720
Tennessee	598,203	393,968	204,234	0	204,234	16,346	187,889	248,639	60,750	212,551
Texas	2,351,083	1,596,418	754,665	-108	754,556	52,489	702,068	765,468	63,401	145,260
Utah	298,882	197,759	101,122	0	101,122	3,958	97,164	49,496	-47,668	-137,485
Vermont	54,021	36,794	17,227	9,624	26,851	1,950	24,902	15,067	-9,835	-34,012
Virginia	468,952	314,826	154,126	0	154,126	16,979	137,146	239,233	102,086	311,131
Washington	867,533	582,313	285,220	1,859	287,079	21,396	265,683	289,448	23,765	70,667
West Virginia	796,078	518,634	277,444	0	277,444	7,288	270,157	76,388	-193,769	-546,995
Wisconsin	487,882	334,332	153,550	0	153,550	11,421	142,129	163,318	21,189	44,660
Wyoming	421,659	288,088	133,571	0	133,571	3,743	129,828	37,410	-92,418	-299,673
United States	28,355,050	19,128,149	9,226,901	108,399	9,335,300	687,201	8,648,099	8,796,349	148,251	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity purchased from nonutilities for distribution in 1988 was 232,118 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A20. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1987
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	707,843	471,268	236,575	0	236,575	10,820	225,755	186,646	-39,110	-94,726
Alaska	48,498	34,432	14,066	0	14,066	1,377	12,689	13,520	831	0
Arizona	550,183	374,122	176,061	-5	176,055	12,963	163,093	125,012	-38,081	-139,513
Arkansas	384,971	261,161	123,811	0	123,811	7,387	116,423	82,557	-33,866	-113,777
California	1,499,867	1,055,133	444,733	26,421	471,154	72,843	398,312	657,833	259,522	580,383
Colorado	308,177	209,878	98,299	0	98,299	7,360	90,939	95,778	4,839	6,447
Connecticut	351,950	238,765	113,185	1,961	115,146	6,495	108,651	87,761	-20,890	-69,650
Delaware	90,645	61,606	29,039	0	29,039	1,664	27,375	23,936	-3,438	-12,016
Dist. of Col.	3,837	3,041	796	0	796	1,863	-1,066	30,733	31,799	97,118
Florida	1,153,400	775,470	377,930	0	377,930	32,592	345,337	417,862	72,525	219,245
Georgia	860,595	567,826	292,769	0	292,769	16,378	276,391	244,571	-31,820	-57,199
Hawaii	76,616	52,060	24,555	0	24,555	1,558	22,997	24,901	1,905	0
Idaho	84,449	56,794	27,655	140	27,795	5,296	22,499	54,953	32,453	95,637
Illinois	1,186,130	811,194	374,936	0	374,936	29,355	345,581	357,540	11,959	-11,641
Indiana	815,045	546,947	268,099	0	268,099	16,507	251,592	230,733	-20,859	-57,106
Iowa	279,846	192,672	87,174	0	87,174	7,292	79,882	92,212	12,331	23,064
Kansas	348,550	243,384	105,165	0	105,165	7,475	97,690	83,356	-14,334	-74,730
Kentucky	689,234	459,082	230,152	0	230,152	8,753	221,399	173,285	-48,114	-120,008
Louisiana	554,709	379,643	175,066	0	175,066	12,375	162,691	201,840	39,149	108,319
Maine	88,648	60,171	28,477	12,777	41,254	2,536	38,718	36,570	-2,147	-7,533
Maryland	378,813	255,127	123,687	0	123,687	10,193	113,494	153,226	39,732	124,522
Massachusetts	348,248	229,733	118,515	16,532	135,047	10,836	124,211	144,610	20,399	76,304
Michigan	886,168	589,206	296,962	2,627	299,590	20,822	278,768	269,479	-9,288	-8,973
Minnesota	374,648	257,256	117,392	6,623	124,015	10,025	113,990	142,538	28,548	73,352
Mississippi	242,219	165,833	76,386	0	76,386	7,214	69,172	92,758	23,586	62,483
Missouri	573,266	385,310	187,956	0	187,956	15,144	172,812	171,011	-1,801	-11,509
Montana	223,692	152,435	71,258	87	71,344	5,424	65,921	42,387	-23,534	-84,719
Nebraska	221,720	151,812	69,909	0	69,909	5,217	64,691	55,222	-9,469	-40,320
Nevada	188,738	129,227	59,511	67	59,578	3,270	56,308	43,515	-12,793	-45,998
New Hampshire	63,036	42,411	20,625	3,791	24,416	2,555	21,861	28,570	6,709	19,237
New Jersey	435,846	301,672	134,174	0	134,174	16,917	117,257	200,441	83,184	222,588
New Mexico	280,661	193,366	87,296	0	87,296	4,146	83,149	42,077	-41,072	-142,440
New York	1,242,413	841,059	401,354	52,754	454,109	35,922	418,187	405,924	-12,263	-70,078
North Carolina	798,141	529,189	268,952	0	268,952	18,547	250,405	281,864	31,459	127,760
North Dakota	251,129	173,950	77,179	4,718	81,897	2,959	78,938	22,509	-56,429	-191,595
Ohio	1,222,786	814,503	408,283	0	408,283	30,332	377,951	444,865	66,915	238,562
Oklahoma	455,512	309,694	145,819	0	145,819	9,339	136,480	123,161	-13,319	-50,938
Oregon	416,018	280,427	135,591	17,938	153,530	11,718	141,811	128,677	-13,135	-48,103
Pennsylvania	1,488,052	992,075	495,977	0	495,977	28,729	467,248	365,563	-101,685	-287,206
Rhode Island	10,720	7,865	2,855	29	2,884	1,384	1,500	20,274	18,774	55,789
South Carolina	675,275	455,506	219,769	0	219,769	11,059	208,709	177,310	-31,399	-92,827
South Dakota	66,491	45,113	21,378	0	21,378	1,679	19,699	19,485	-213	-2,483
Tennessee	574,794	375,833	198,962	0	198,962	12,548	186,413	237,920	51,507	206,754
Texas	2,259,333	1,533,874	725,459	-135	725,324	51,417	673,907	737,219	63,312	162,785
Utah	273,457	183,563	89,893	127	90,020	3,528	86,492	45,711	-40,781	-123,688
Vermont	49,783	33,971	15,812	7,771	23,582	2,048	21,534	13,979	-7,556	-27,594
Virginia	447,146	301,465	145,682	0	145,682	15,735	129,947	228,083	98,136	302,087
Washington	878,213	592,439	285,774	3,877	289,652	23,010	266,642	263,005	-3,637	-26,103
West Virginia	767,001	499,596	267,406	0	267,406	6,616	260,790	71,907	-188,882	-530,791
Wisconsin	478,969	328,737	150,232	0	150,232	10,972	139,260	153,459	14,200	25,133
Wyoming	402,138	274,630	127,508	0	127,508	3,311	124,197	35,861	-88,336	-284,338
United States	27,057,621	18,281,526	8,776,096	158,101	8,934,197	655,509	8,278,688	8,384,213	105,525	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity purchased from nonutilities for distribution in 1987 was 171,163 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.

Table A21. Disaggregated Data for Net Interstate Flow and Electrical System Energy Losses, 1986
(Billion Btu)

State	(1) Total Energy Input at Electric Utilities (TIEUB)	(2) Electric Utilities Conversion Losses and Plant Use (ELPLB)	(3) Electric Utilities Net Generation (Output) (ELEOB)	(4) Net Imports (ETNIB)	(5) Net Generation Plus Net Imports (ETENB)	(6) Transmission & Distribution Losses (ELLOB)	(7) Electricity for Sale to End Users (5) - (6) (ELFSB)	(8) Electricity Sold to End Users ^a (ESTCB)	(9) Net Interstate Flow of Electricity: (8) - (7) (ESISB)	(10) Net Interstate Flow of Electricity and Associated Losses (ELISB)
Alabama	702,953	468,976	233,977	0	233,977	14,600	219,377	176,049	-43,328	-121,943
Alaska	53,237	38,730	14,507	0	14,507	1,161	13,346	13,812	466	0
Arizona	541,616	367,006	174,610	-5	174,605	11,937	162,668	115,957	-46,711	-158,909
Arkansas	372,374	252,495	119,879	0	119,879	8,031	111,848	78,244	-33,605	-114,148
California	1,431,585	1,015,781	415,804	12,899	428,703	66,728	361,975	632,650	270,675	616,848
Colorado	305,926	209,429	96,497	0	96,497	6,891	89,606	92,673	3,068	-78
Connecticut	342,118	232,293	109,824	1,468	111,293	6,303	104,990	83,681	-21,308	-70,440
Delaware	89,237	60,541	28,697	0	28,697	1,578	27,119	23,284	-3,834	-12,392
Dist. of Col.	2,948	2,385	563	0	563	1,625	-1,062	29,303	30,365	93,761
Florida	1,127,712	757,631	370,081	0	370,081	26,846	343,235	398,095	54,859	186,112
Georgia	756,658	501,067	255,591	0	255,591	15,059	240,531	233,688	-6,843	14,580
Hawaii	72,884	49,484	23,401	0	23,401	1,456	21,945	23,994	2,049	0
Idaho	126,956	85,489	41,467	0	41,467	4,660	36,807	53,879	17,072	50,860
Illinois	1,146,607	781,893	364,714	0	364,714	26,234	338,480	347,197	8,717	-760
Indiana	806,552	542,661	263,891	0	263,891	15,715	248,175	219,701	-28,474	-81,477
Iowa	266,268	183,914	82,354	0	82,354	6,833	75,521	89,925	14,404	30,510
Kansas	336,986	236,226	100,760	0	100,760	7,177	93,582	81,323	-12,259	-68,597
Kentucky	688,018	459,703	228,315	0	228,315	9,304	219,011	169,561	-49,449	-128,418
Louisiana	564,528	384,226	180,302	0	180,302	12,485	167,817	202,305	34,488	103,136
Maine	116,243	79,085	37,158	8,785	45,943	2,509	43,434	34,813	-8,622	-28,246
Maryland	393,955	265,212	128,743	0	128,743	9,583	119,160	143,170	24,009	78,545
Massachusetts	347,418	229,769	117,649	12,378	130,027	9,986	120,040	136,624	16,584	65,585
Michigan	787,091	527,572	259,519	2,347	261,866	19,643	242,223	260,174	17,951	64,372
Minnesota	308,685	211,780	96,905	23,407	120,312	9,924	110,388	132,160	21,771	55,816
Mississippi	205,375	140,617	64,758	0	64,758	7,704	57,054	90,527	33,473	93,390
Missouri	571,762	386,828	184,934	0	184,934	14,455	170,479	164,710	-5,770	-28,174
Montana	241,880	165,286	76,594	-9	76,585	6,468	70,116	47,154	-22,963	-86,232
Nebraska	206,110	141,831	64,279	0	64,279	5,325	58,955	54,182	-4,773	-27,295
Nevada	217,183	149,427	67,756	0	67,756	3,035	64,721	39,764	-24,956	-85,950
New Hampshire	64,910	44,035	20,874	2,838	23,713	2,419	21,294	26,859	5,566	15,044
New Jersey	321,875	223,670	98,205	0	98,205	15,061	83,144	191,047	107,902	308,632
New Mexico	262,720	182,195	80,526	0	80,526	3,964	76,561	40,606	-35,955	-128,710
New York	1,180,502	800,763	379,738	52,756	432,494	33,409	399,085	392,067	-7,018	-48,084
North Carolina	764,329	502,296	262,032	0	262,032	18,755	243,278	264,210	20,933	107,639
North Dakota	252,146	176,461	75,686	3,334	79,020	2,883	76,138	23,368	-52,770	-185,233
Ohio	1,147,264	766,804	380,460	0	380,460	29,301	351,160	423,903	72,743	251,734
Oklahoma	438,737	298,594	140,143	0	140,143	9,873	130,270	122,010	-8,260	-36,069
Oregon	502,097	339,071	163,026	4,520	167,546	9,407	158,139	119,646	-38,492	-121,069
Pennsylvania	1,535,207	1,031,644	503,563	0	503,563	26,296	477,266	349,823	-127,443	-380,692
Rhode Island	9,333	6,863	2,470	22	2,492	1,257	1,235	19,303	18,068	54,305
South Carolina	596,499	403,563	192,936	0	192,936	10,036	182,900	168,667	-14,233	-39,851
South Dakota	84,419	57,779	26,640	0	26,640	1,702	24,938	19,358	-5,580	-20,531
Tennessee	557,208	364,584	192,624	0	192,624	14,344	178,280	231,360	53,080	206,345
Texas	2,264,646	1,538,401	726,246	-36	726,210	50,065	676,145	727,676	51,531	136,997
Utah	174,660	117,273	57,387	0	57,387	3,393	53,994	44,320	-9,674	-28,391
Vermont	33,873	23,128	10,744	5,701	16,446	2,229	14,217	12,717	-1,499	-9,357
Virginia	450,040	304,543	145,497	0	145,497	12,248	133,249	215,861	82,612	262,363
Washington	970,774	655,055	315,720	-7,924	307,796	18,070	289,726	257,168	-32,558	-97,788
West Virginia	772,310	507,813	264,497	0	264,497	6,398	258,099	70,297	-187,802	-540,310
Wisconsin	468,759	322,777	145,982	0	145,982	11,511	134,471	159,289	24,817	56,938
Wyoming	316,660	218,485	98,176	0	98,176	3,059	95,117	34,029	-61,088	-204,355
United States	26,299,833	17,813,132	8,486,701	122,481	8,609,182	618,934	7,990,248	8,082,185	91,937	0

^a Includes electricity generated by nonutility power producers. The U.S. total electricity purchased from nonutilities for distribution in 1986 was 136,337 billion Btu.

Source: Energy Information Administration calculations using data from the Combined State Energy Data System, the Form EIA-759 database, and the Form EIA-861 database.